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ABSTRACT

Drawn from the experiences of the Cornell Youth and Work Program, a 4-year demonstration project that adapted elements of European apprenticeship in the United States and emphasized opportunities for youth to learn at work, this guide is written for people in workplaces and schools who plan, direct, or evaluate work-based learning opportunities for youth. Following an introduction that describes the demonstration projects, types of work-based learning, and the principles derived from the project, the guide contains seven sections. The sections cover the following topics: (1) technical competence (getting started, designing a multiyear program); (2) breadth (why teach all aspects of the industry, why rotate, why support projects and complex activities, what makes a good project); (3) personal and social competence; (4) expectations and feedback; (5) teaching roles (coordinating, managing, coaching, mentoring in work-based learning programs); (6) academic achievement; and (7) career paths after high school. A concluding section suggests next steps for restructuring schools and workplaces, forming partnerships, and building a school-to-work system. An appendix contains statistics and samples from the demonstration project. (KC)

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Learning Well at Work: Choices for Quality

Mary Agnes Hamilton
Stephen F. Hamilton

CORNELL YOUTH AND WORK PROGRAM

PREPARING YOUTH FOR THE FUTURE

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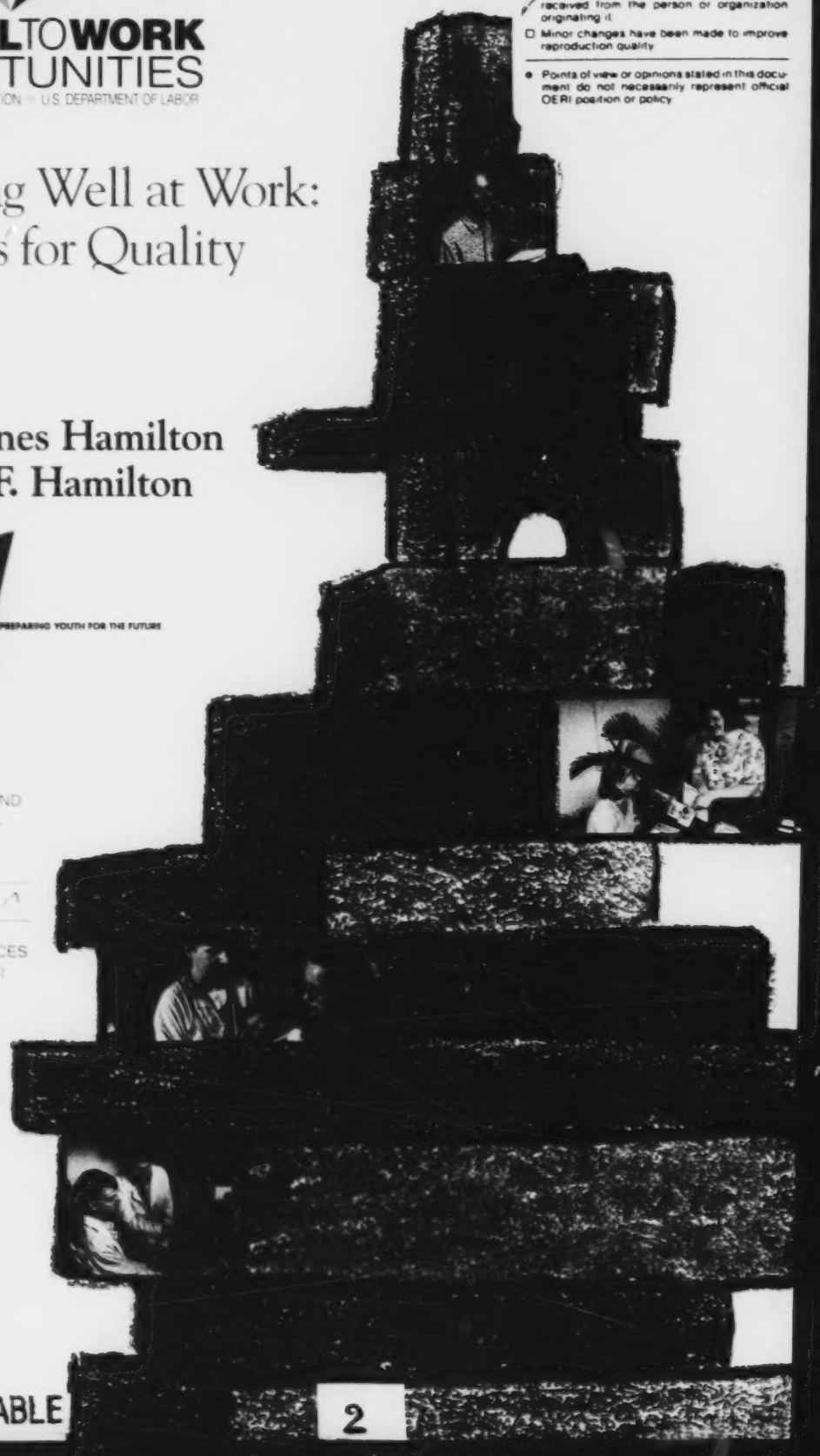

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This report describes a research and development project of the Department of Human Development and Family Studies, College of Human Ecology, Cornell University. The project has been supported by two grants from The Pew Charitable Trusts. Additional support was provided by an initiative of the New York State legislature sponsored by former assembly majority leader James R. Tallon, Jr., and by grants from the Charles Stewart Mott Foundation and the Dr. G. Clifford and Florence B. Decker Foundation. Dean Francille Firebaugh's unwavering confidence and support have been crucial to the project's continuation.

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Staff: Amy Tietjen Smith, Cynthia Miller, Jennifer Jameson, Haya Novak, Renée Ferrari, Lynn Okagaki, Jeff Claus, Peg Kelly, Ami Kadar, Debbie Stayer Kelly

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The adults named in the body of the report represent several hundred teachers, counselors, administrators, coaches, mentors, managers, and coordinators whose dedication and skill made apprenticeship work. We appreciate and respect their efforts and those of the young people and their parents.

Participating Employers

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Participating Schools

Binghamton High School
Greene Central High School
Seton Catholic Central High School
Susquehanna Valley High School
Union-Endicott High School
Whitney Point High School
Windsor Central High School
Broome Community College

Coordinating Organizations

Cornell Cooperative Extension of Broome County provided the project's initial base in the community. Ben Wood helped to get it started with support from Penny Corino and Sue Bair. Responsibility for youth apprenticeship was transferred to the School and Business Alliance of Broome and Tioga counties during the fourth year, under the leadership of Alicia Terry Boyce and Ruth Henneman.

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Introduction

Learning and working are increasingly interdependent throughout life. Rather than learning during childhood and adolescence and working during adulthood, people must continue learning over their entire lifetime. Workplaces are joining schools as significant learning environments for youth as well as for adults. Along with schools, homes, playgrounds, libraries, cyberspace, and other locations, workplaces are part of the education system of the future.

This guide is written for people in workplaces and schools who plan, direct, or evaluate work-based learning opportunities for youth. The choices that determine the quality of work-based learning provide the guide's framework. It is grounded in a four-year demonstration project that adapted elements of European apprenticeship in the United States and emphasized opportunities for youth to learn at work. We used the terms "youth apprenticeship" and "apprentice" to communicate our intention to create a multi-year sequence of work-based and school-based learning opportunities providing formal certification of participants' competence.

The Cornell Youth Apprenticeship Demonstration Project was one of several initiatives in the early 1990s that used the term "youth apprenticeship." The School-to-Work Opportunities Act of 1994 was inspired in part by "the time honored apprenticeship concept" and identified youth apprenticeship as one of the promising school-to-work activities that should be expanded. To avoid overlap with existing programs, we selected occupational areas that did not have registered apprenticeships. We sought advice from leaders of organized labor and representatives of the New York State Department of Labor. Our long-term plan was to register the programs we created once they had been tested. Because this report addresses the whole range of work-based learning opportunities, we refer in most cases to "youth," "students," or "participants" rather than apprentices and to "the program" or "the demonstration project" rather than apprenticeship.

The demonstration project tested approaches that can be adapted to other communities and incorporated into more comprehensive systems. But the general lessons we learned are more important than the specific details of the project. Both the project and this guide were motivated by the belief that lessons about creating high-quality youth apprenticeship programs can be applied to create, expand, and strengthen all types of work-based learning.

The Demonstration Project

Planning for the Cornell Youth Apprenticeship Demonstration Project began in July 1990. After exploring potential sites in central New York, we selected Broome County because of its economic diversity, the strength and support of its local institutions, and the support of community leaders.[1]

Participants in the demonstration project began as high school juniors. They were employed 10 to 20 hours per week in one of three occupational areas: health care, administration and office technology, and manufacturing and engineering technology. They remained enrolled in school full-time and received credit for their work experience, which they fit into their schedules either at the beginning or the end of the school day.[2]

Occupational Areas

We selected the occupational areas in which students would be placed based on labor market projections from the regional office of the New York State Department of Labor. The three occupational areas offer employment at the technician level, which requires postsecondary education and specialized knowledge and skills. People in these occupations are increasingly expected to have multiple skills and, in many cases, to work in cross-trained teams.

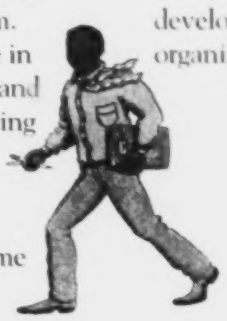
Health Care (HC) differs from most other occupational fields in the United States because it has sharply defined job titles and specific qualifications. Professional organizations and state health departments establish requirements and assess individuals' qualifications. Anyone wishing to become a physical therapist, for example, can readily learn what steps to take to become certified. An advantage of placing youth in health care is that workers in hospitals view teaching as a legitimate function and are accustomed to offering internships and practica.

One challenge posed by health care occupations is that the specialties can be too narrow and sometimes constitute dead ends. For example, one physical therapist warned that the two-year college program leading to certification as a physical therapy assistant did not include the required courses for physical therapists so that someone wishing to move from being an assistant to being a physical therapist must begin with the first year of college.

National debates about health care policy, cost containment efforts, and approaches such as health maintenance organizations and home care have created uncertainties in the health care scene that impeded hospitals' capacity to take more youth. Ultimately, however, the need for health care technicians like those in the demonstration project is likely to increase.

In contrast to health care, **Administration and Office Technology** (AOT) is a relatively fluid and open occupational area. The most sharply defined specialties are in accounting and computer programming; most other subfields are broad, requiring general communication, organization, and social skills. Administrative work is available in a variety of organizations, including hospitals, factories, public and private nonprofit organizations, and financial services institutions. We had two models for apprenticeship in this area. One was the training of German "merchants," a term that encompasses a wide range of middle-level office jobs, including secretary, bookkeeper, personnel officer, account executive, and inventory control specialist. The other model comes from American firms employing multiskilled workers in self-managed work teams. For example, some insurance companies have changed their procedures and retrained their workers for "once and done" operations so that a customer can call in with a series of questions about a policy and get answers from the same person—equipped with a computer—who is also prepared to sell additional products based on an assessment of the customer's needs. Such employees need more education and training than do those who process one part of one form. Despite the need for people in AOT with more advanced and more diverse skills, downsizing and buyouts restricted the number of AOT positions because functions were eliminated or shifted to home offices in other locations.

The metropolitan region around Binghamton, New York, is heavily industrial, making it an excellent locale for **Manufacturing and Engineering Technology** (MET) placements. The multinational firm Asea Brown Boveri (ABB), which we visited in Switzerland, provides a model apprenticeship in this occupational area. It combines formerly separate apprenticeships in drafting, machining, and electronics to produce electro-mechanical technicians capable of performing many tasks and collaborating with specialists in related fields. We hoped to achieve comparable breadth, giving youth multiple skills and career options. Even more than in the other two occupational areas, employment prospects were limited because consolidation and downsizing reduced the number of jobs in manufacturing. Nevertheless, some firms with shrinking workforces participated because they had a growing need for the kinds of workers the program was designed to produce. And some manufacturing firms defied the general trend and expanded. Furthermore, employers agreed to teach youth not only to meet their own needs but to help strengthen the community's economy and educational system while furthering their own development as learning organizations.



Workplace Participation

Four firms took part in the first year of the demonstration project; eleven were involved by the fourth year. Youth enrollment grew steadily, if modestly: there were 22 in the first year, 41 in the second, 47 in the third, and 59 in the fourth. A total of 100 youth participated during four years (see Table 1 in Appendix, p. 79).

We would have preferred a larger number of employers,[3] each enrolling larger numbers of youth. In the fourth program year, three of the original firms had 10 placements each, three firms had 5 to 6, one had 4, another 3, two had 2, and one had a single placement. Money to pay youth was not the key resource required of employers. Most found that within six weeks or less, youth were productive enough to earn their wages. As youth became more competent, their productivity substantially exceeded their earnings. Far more serious than wage costs were the costs of a coordinator's time and that of other adult employees for

- supervising youth.
- communicating with school and parents.
- planning and coordinating within and across workplaces.
- orienting, training, and supporting coaches and mentors.
- designing a learning plan and assessing performance.

These costs are not easily quantified, but they are real and substantial. They vary considerably among employers.[4] Economies of scale result when workplaces take larger numbers of youth because the costs do not increase proportionately with each added participant. Employers can reduce some costs by collaborating within a regional partnership, a state, or an industry, for example, and sharing the costs of planning a learning program.

School Participation

Most high schools in the region wished to participate in the project, but we limited the number to five the first year and later to seven so we could concentrate and develop resources within those schools. Each high school designated one faculty member as coordinator to

- communicate with workplaces.
- involve a school committee in program development, recruiting and evaluation, and developing academic connections to work-based learning (curriculum, senior projects, staff development) and a school-based advising system led by faculty members.

Broome Community College was represented on the project's advisory committee; six youth enrolled there while continuing their participation; and representatives from the college served on education committees related to each occupational area.

Participants and Their Characteristics

Active recruiting generated literally hundreds of applicants for placements. We advocated the recruitment of "middle students" even though we strongly believe all young people can benefit. Those already bound for four-year colleges have less need for apprenticeship; those with severe problems are best served by preapprenticeship programs. Entering grade point averages (GPA) of participants were in the C+/B- range, indicating that employers chose mostly middle students. Inclusion of students with a range of GPAs helped to avoid the stigma often attached to special programs (see Table 2 in Appendix, p. 79).

A high school diploma or less was the highest education level attained by either parent in 54 percent of the families. In 43 percent of the families one parent had two or more years of college (see Table 3 in Appendix, p. 80).

The female majority among participants (59 percent) reflects the predominance of traditionally female occupations in health care and in administration and office technology (see Table 4 in Appendix, p. 80). Male participants clustered in manufacturing and engineering technology, which accounted for only 28 percent of the positions. Employers worked with us to try to break gender stereotypes and enrolled youth across traditional gender lines.

Young people from minority groups participated in the program at twice their proportion of the population (13 percent compared to 6 percent of 15- to 19-year-olds in Broome County; see Table 5 in Appendix, p. 80). This

reflected employers' commitment to affirmative action and their view of this project as a means of "filling the pipeline" with qualified potential applicants. Teachers and counselors also encouraged applications from minority youth.

Governance

The demonstration project was intended to have a limited lifetime. If it succeeded, it would become part of the local educational and employment systems under local control. We planned for this eventuality from the beginning, forming a local advisory committee, committees of coordinators from schools and firms, and education committees for each occupational area, seeking collaboration with other educational institutions, and, most important, trying always to empower our partners in the schools and workplaces so that they would be able to continue without us. A coordinating or intermediary organization was also needed to support further development.[5] Responsibility for the project was transferred from Cornell to the community partners in planned steps during the fourth year.

Types of Work-Based Learning

Apprenticeship is the epitome of work-based learning, but work-based learning encompasses a wider range of learning opportunities. The issues we encountered in the demonstration project apply to all types of work-based learning. Choices must be made about the same issues, though the most appropriate choices vary among different types of work-based learning. We define work-based learning as occurring intentionally in a location where the primary activity is producing goods or services.

The School-to-Work Opportunities Act was inspired by apprenticeship but wisely supports many types of work-based learning occurring from kindergarten through college, as indicated in Figure 1. Eight major types of work-based learning may be grouped into three categories.

Types of Work-Based Learning

[redacted]

- *Field trips*—onetime visits to observe
- *Job shadowing*—longer-term, sometimes multiple visits to observe by following a worker

[redacted]

- *Service learning and unpaid internships*—voluntary service, not necessarily with a career focus
- *Youth-run enterprises*—workplaces created to give youth employment and management experience

Employment

- *Youth jobs*—jobs ordinarily open to teenagers but often not learning opportunities
- *Subsidized employment training*—paid work as part of a training program
- *Cooperative education and paid internships*—school-related work experience
- *Youth apprenticeship*—long-term (over several years) work and learning program leading to certification

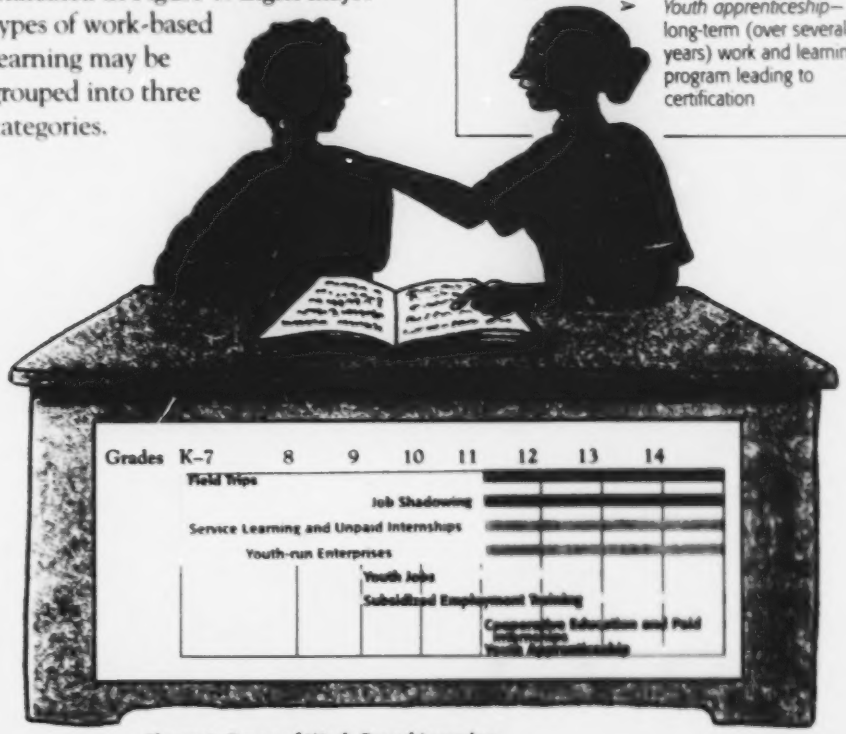


Figure 1. Types of Work-Based Learning

Work-based learning can occur in schools if students are actively engaged in producing goods or services. If students perform services such as cleaning rooms or serving food in the cafeteria, if they work in school-based enterprises that produce goods or services for sale, if they serve as assistants or apprentices to teachers, librarians, or other staff members, and if these activities are designed as learning opportunities, then they are doing work-based learning even though they are located in a school building. We define "work" as employment-related activity rather than in its broader meaning as purposeful activity that includes schoolwork, working out at a sport, and so on. By our definition, studying about work, learning how to work, or simulating a workplace are all school-based learning, not work-based.

Work-based learning opportunities may be differentiated along several dimensions: their *purposes*, the *activities* participants engage in, the nature of their *connections with school*, and the *investment* of time, money, and other resources by the employer and the youth. Figure 2 defines these four dimensions. The three levels indicate shifts toward increasingly intensive experiences. Those shifts are cumulative, that is, each level incorporates and supersedes the preceding one. Work-based learning experiences at Level 1 provide a foundation for experiences at Levels 2 and 3. For example, cooperative education ideally builds on previous exploration gained through field trips. When it teaches technical competence (Level 3), cooperative education will at the same time provide opportunities for more extensive career exploration than is available through field trips at Level 1. In addition, cooperative education at Level 3 will continue to nurture personal and social competence (Level 2). Higher-level work-based learning tends to require more investment.

	Purposes	Activites	School connections	Investment
Level 3	Technical competence	Planning, performing, and evaluating complex tasks	Integrated	More
Level 2	Personal and social competence	Performing routine tasks	Interdependent	
Level 1	Exploration	Observation	Related	Less

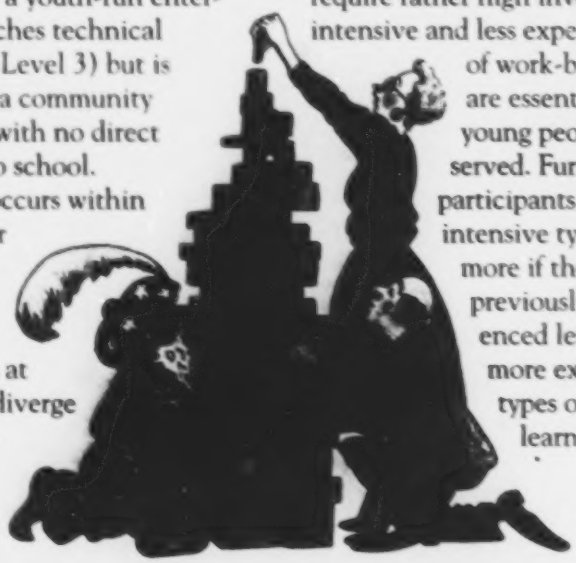
Figure 2. Dimensions of Work-Based Learning

Field trips are typical of Level 1, youth apprenticeship of Level 3. However, the levels of all types of work-based learning may vary depending on how they are designed. For example, students in Level 2 service learning might engage in a low-intensity activity for a brief period, such as picking up trash on Earth Day, whereas participants in an intensive service-learning project at Level 3 might learn and perform complex tasks over an extended time, as in national service and conservation corps programs.

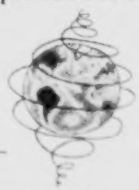
Assigning any work-based learning opportunity to a particular level is complicated. For example, even though the activities involved in a field trip are, by definition, limited to observation (Level 1), the purpose might be gaining highly technical knowledge (Level 3), as when a structural engineering class visits a bridge during a windstorm to learn about stress. Another example of levels varying across dimensions is a youth-run enterprise that teaches technical competence (Level 3) but is sponsored by a community organization with no direct connection to school.

Variation occurs within levels too. For example, work-based learning opportunities at Level 3 may diverge widely in the depth and breadth of the technical competence they teach; subsidized employment training programs may range from summer job programs that teach few if any technical skills to programs such as Job Corps and Youthbuild that teach advanced technical skills.

The framework in Figure 2 may be used to situate a program using a particular type of work-based learning within a comprehensive school-to-work system, to compare it along these dimensions with other programs, and to assess the match between its purposes and participants' needs. But a program's place along these dimensions does not determine whether it is better or worse than another program. Exploratory field trips for elementary school children will appropriately be less intensive and less comprehensive than cooperative education placements for high school students studying marketing. Because youth apprenticeship, cooperative education, and subsidized employment training all require rather high investment, less intensive and less expensive types of work-based learning are essential if all young people are to be served. Furthermore, participants in the more intensive types will gain more if they have previously experienced less intensive, more exploratory types of work-based learning.



We realized when we began the demonstration project that we were trying to create independently one part of what would ideally be an entire system. In a comprehensive system, young people would choose an occupational area based on adequate knowledge, experience, and counseling to make strong commitments. Youth apprenticeship would be a capstone experience following participation in a range of work-based learning opportunities, each contributing knowledge about the work world to help young people choose a career path.



Principles

In the following pages we state seven principles to guide the practice of work-based learning. Each principle addresses a set of choices that employers and educators planning and maintaining work-based learning opportunities must make. By positing principles and choices rather than constructing a model, we emphasize that diverse approaches can be effective.[6]

Principles for Work-Based Learning

1. **Technical Competence.** Youth gain basic and high-level technical competence through challenging work.
2. **Breadth.** Youth gain broad technical competence and understand all aspects of the industry through rotation and projects.
3. **Personal and Social Competence.** Youth gain personal and social competence in the workplace.
4. **Expectations and Feedback.** Workplace teachers convey clear expectations to youth and assess progress toward achieving them.
5. **Teaching Roles.** Youth learn from adults with formally assigned teaching roles.
6. **Academic Achievement.** Youth achieve high academic standards.
7. **Career Paths.** Youth identify and follow career paths.

We developed some of these principles before the demonstration project began, albeit in different terms.[7] Others emerged from the project, reflecting the active contributions of many partners in the enterprise. We hope they will prove useful to all who are engaged in work-based learning, especially as a tool to assess program development needs and set priorities. See rating form in Appendix, p. 81.

1. Technical Competence

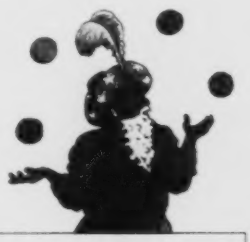
Youth gain basic and high-level technical competence through challenging work.

1. Identify work tasks that teach technical competence.
2. Organize learning objectives as modules in core and elective units.
3. Design a multi-year learning plan that is increasingly challenging.

Work-based learning teaches young people how to perform work tasks. They begin by learning basic technical skills that nearly anyone can learn quickly. Basic technical skills serve as building blocks for acquiring high-level skills. Training over a period of years leads to high-level technical competence. Technical competence includes not only mastering procedures but also understanding fundamental principles and concepts underlying procedures, increasing capacity for analytical judgment, and, in most occupational areas, becoming computer literate. Less intensive types of work-based learning teach less technical competence but may be improved by enhancing their technical content.

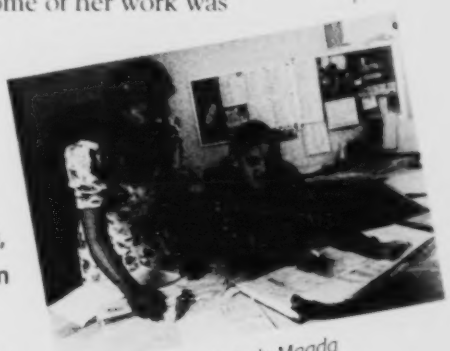
In addition to learning how to perform work tasks, youth learn how to learn. They acquire a firm foundation of knowledge and skills, appreciation for expertise, confidence in their own ability, and understanding that learning continues for a lifetime. They must learn specific work skills, but those skills should be understood as a foundation for continuous learning, not as ultimate or sufficient. Through work-based learning, youth prepare to function in learning organizations.

All the evidence we examined indicated strongly that youth in the demonstration project gained technical competence. We observed them performing complex tasks. Their coaches praised their competence and recorded their acquisition of specific skills over time. When asked at the end of each year, "What stands out for you in your experience as an apprentice," they revealed their appreciation for the centrality of technical competence; without further prompting they spoke of what they had learned.[5]



"Miss Accounts Payable"

Lisa Black described how she learned technical procedures, including computer use. Although some of her work was routine, she conveyed great pride in her contributions.



Lisa Black (r.) with Judy Magda

"I do a booking procedure. I put the invoices in the computer, and then the checks get run from that. I do the little [routine] work that no one else wants to do, like stuff the envelopes, seal them, run them through the mail machine, and file all the paperwork from the checks. I was basically Miss Accounts Payable while the lady I work with was on maternity leave because I knew what was going on. When I went on vacation, everything went crazy. I came back and the treasurer said, 'We missed you so much.' It makes me feel important that I am doing something that's beneficial to the company. I'm not just there to file."

Lisa Black
Doron Precision Systems, Inc., and Binghamton High School

To foster the acquisition of technical competence, designers of work-based learning programs use the same approach as the designers of classroom instruction; they develop a curriculum. A work-based learning curriculum identifies and sequences learning objectives and specifies the tasks, projects, and activities that enable youth to achieve them.

Tasks

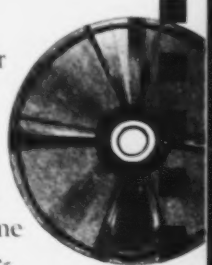
To begin building a work-based learning curriculum, managers list work tasks that youth will perform and the necessary technical skills, including computer skills and principles related to understanding the procedures (see Appendix, p. 83). Initially in the demonstration project, each department listed technical skills specific to its own area, without coordination among departments.

Building Blocks

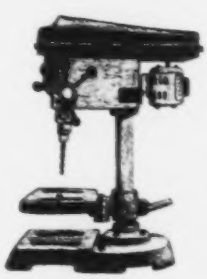
As new firms joined the project and more departments in each firm participated, the number of learning objectives expanded exponentially. To order the objectives, we convened adults working with youth in the same occupational area and introduced the terms: modules, core units, and elective units. Modules contain a list of related objectives, such as computer use,

documentation, computer-aided design (CAD), measurement, welding, and safety (see Appendix, p. 84).

Modules are like building blocks. They can be put together in different combinations. For each occupational area, we grouped modules containing the fundamental techniques and concepts that all youth had to master and named them the core unit. Elective units contained modules related to subdisciplines and to procedures that might be specific to one or a few firms. Firms selected elective units to teach technical skills related to their industry and future workforce needs. Each occupational area had both a core unit and elective units.



Core modules functioned as components of skill standards for the occupational areas in which youth worked. The framework of modules in core and elective units gave choices to employers and youth and also achieved some standardization. Evaluation notebooks contained units and modules for technical competence and served as a record of what participants learned (see a sample log, p. 35).



Designing a Multi-Year Program

Ideally, coherent programs of work-based and school-based learning span secondary and postsecondary education. Employers, employees, and educators in the demonstration project formed education committees to determine how to relate work-based learning to high school and college degree programs. The results of these deliberations suggest that the following points need to be addressed in designing multi-year work-based learning opportunities.

➤ Link work-based learning to the firm's strategic planning for the workforce of the future.

- Connect people engaged in work-based learning to strategic planning.
- Identify positions, including new, combined, or current positions, for which youth would qualify upon completion of their multi-year work-based learning experience.
- Identify competencies desired of highly competitive candidates for these positions.

➤ Design a multi-year sequence of work-based learning.

- Groups of managers or high-level individuals should decide where youth are placed; otherwise, their placements may be a patchwork rather than a coherent sequence.
- Follow a learning plan to determine what youth do and for how long, rather than merely using them to meet production needs.
- Prioritize, cluster, and sequence modules as building blocks for learning.
- Design periodic rotations, selecting placements to achieve both specialization and cross-training and to teach all aspects of the industry (see Figure 3, p. 18).

➤ Promote multi-year educational programs and courses that complement work-based learning.

- Recommend or require specific high school courses (e.g., college entry diploma, four credits of math).
- Recommend college programs that give youth desired qualifications; give scholarships for postsecondary education.
- Engage school leaders at secondary and postsecondary levels; secure their commitment to making connections with work-based learning.

Building a solid multi-year program requires that coaches and managers determine long-range goals for their workers and learning objectives that match those goals. Coaches and managers can justify their selection of everyday work tasks for youth based on those goals and objectives.

"You get to see the bigger picture."

Lonni Kint, a manager, coach, and mentor at Blue Cross Blue Shield of Western New York, convened an in-house seminar to review goals and learning objectives for the demonstration project in her firm. The group agreed that successful participants would be competitive candidates to join customer service or human resource teams, both of which require computer skills as well as communication skills and analytical judgment. As the coaches discussed positions and skills, they also debated the content, level, and breadth of training to offer, raising the following questions:

- What should youth learn?
- Can they learn this skill in school, through a computer program, or in a department at our firm?
- What should youth learn during the first year, the second, in college?
- Do we have higher learning expectations for some youth than for others? Is that just?
- Should all youth be expected to learn complex tasks?

Lonni reflected in an end-of-the-year interview that working on the regional administration and office technology education committee had expanded her perspective on learning, enabling her to see issues beyond her immediate department:

Lonni Kint (r.) with Carrie Holden

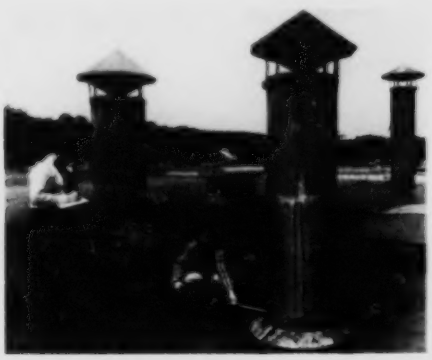
"I'm on an administration and office technology education committee and I think [its goals] are well thought-out. And I would like to see all the coaches get the chance to be on a committee like that. It really gives them a much better perspective to see the bigger picture. We get so narrowly focused that we're concentrating so much on the business aspect. Then once you start to meet and network with people from the high school and people from Broome Community College, people from other companies, you get to see the bigger picture, and I think it really helps give you better ideas. Maybe you see where you could be doing things differently and maybe how you can make corrections at the schools or other businesses to do things a little differently. Strength in numbers though. It's a good way to get more influence where it needs to be."

Lonni Kint
Blue Cross Blue Shield of Western New York

Conclusion

Rapidly changing technology and global competition have heightened the need for advanced skills but simultaneously accelerated the rate at which they are outmoded. To succeed in the twenty-first century, workers must be highly skilled and highly adaptable, both specialized and cross-trained. Work-based learning can help meet this need, but it requires that employers identify as well as they can what skills their workers will need in the future and then carefully plan work-based learning programs to teach those skills. Because education is fundamental to high-level technical skills, employers must collaborate with high schools and community colleges, which can provide the disciplinary base for skills and further skill learning, but only if they know what they should be teaching and set high academic standards.

Lisa Wolf (l.) works with her coordinator and manager, Lisa Wrobleski at Anitec.



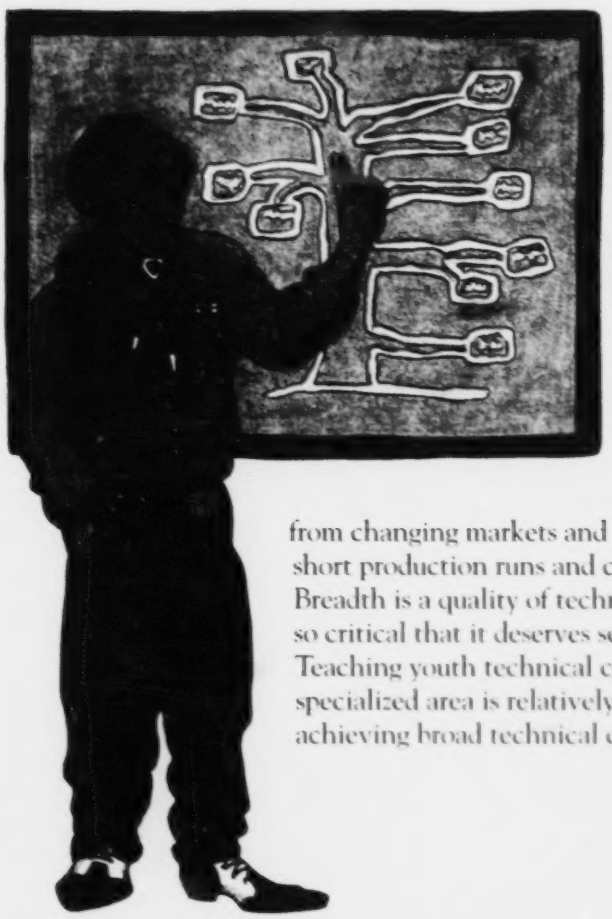
Colin Evans (r.) surveys the plant's exhaust system with Dave Minerley at The Raymond Corporation.

Linda Brenners coaches Melissa Storti (r.) in the neonatal unit at Lourdes Hospital.

2. Breadth

Youth gain broad technical competence and understand all aspects of the industry through rotation and projects.

1. Inform youth about all aspects of the industry.
2. Rotate youth through several departments or placements.
3. Support projects and activities that teach multiple skills and broad knowledge.



Along with teaching young people how to continue learning, broad training reduces the chance that their skills will become obsolete. Multiple skills enable a worker to move readily from one assignment to another, to participate in flexible work teams, and to respond to rapid changes in production that result from changing markets and technology and from short production runs and customized products.[10] Breadth is a quality of technical learning, but it is so critical that it deserves separate treatment. Teaching youth technical competence in a single, specialized area is relatively easy compared to achieving broad technical competence.

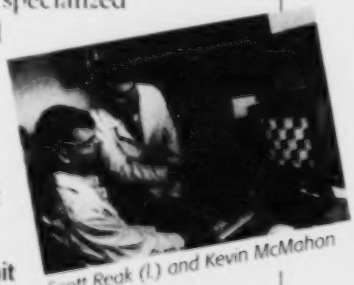
Why Teach All Aspects of the Industry?

The phrase "all aspects of the industry" denotes the goal of introducing youth to the larger context in which they do their work—the economic and organizational structures surrounding them. An old story about two stonemasons responding to the question, "What are you doing?" illustrates the point. One replied, "I'm squaring this stone." The second said, "I'm building a cathedral." Workers who know how their actions contribute to the whole are more motivated than those whose vision is narrow. They are also able to answer questions and solve problems that go beyond their immediate setting. And they can aspire to a range of career possibilities. A stone finisher can do only one job. A cathedral builder might become a foreman, a contractor, or an architect.

Breadth should be assured from the beginning by providing youth with information about the employing firm and the industry. Orientation sessions and literature are one source of such information. Another is participation in firm-wide events and activities such as annual meetings or picnics. Youth should receive newsletters and any information distributed to other employees.

"That's how I figure out how that place works."

When asked what he had learned, Scott Reak explained that his work in microscopy not only taught him specialized technical skills but also helped him understand how different departments work together.



Scott Reak (l.) and Kevin McMahon

"How the microscopy department works, why they do things. I learned how to use the equipment they have—pretty technical stuff. I got to deal with people from other departments because they submit samples to us and I got to figure out why they needed the analysis done. And that's how I figure out how that place works, just from working there."

Scott Reak
Antec and Susquehanna Valley High School

Why Rotate?

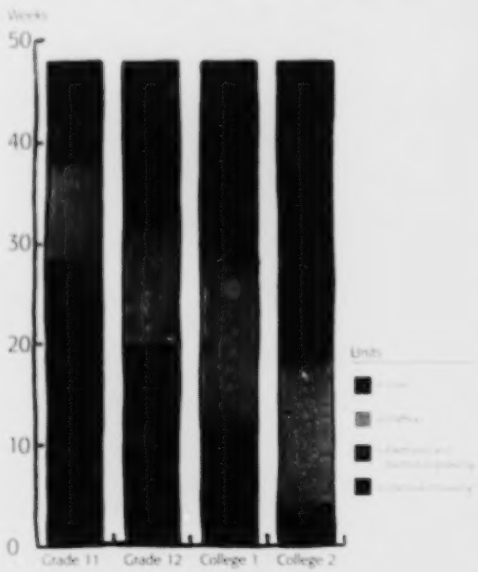
Rotation is the most important way to assure breadth. Youth should move systematically through several different placements to acquire a variety of skills but also to learn the contributions of different units and how they function. Some program coordinators at firms were very creative in finding ways to help participants become acquainted with their organizations. For example, moving patients from one part of the hospital to another via wheelchair, gurney, or walking is an excellent way for youth in health care to learn how to deal with patients while also learning about the locations and functions of many different parts of the hospital. A brief placement in the mail room can serve the same purpose for youth in administration and office technology. The tool room can help orient youth in manufacturing and engineering technology.

Ideally, rotations are planned to enable youth to learn systematically the competencies specified in the core and elective modules. Rotations may be customized to meet young people's interests and career paths and the needs of the firm. Two youth apprentices in the same occupational area in the same firm might follow different rotation patterns.

Rotation can create tensions for both youth and adults. A coach or manager may feel that the investment is paying off when the young person can perform tasks competently. Youth often develop personal attachments and a sense of security from being in a place where they know what to do. As a result, both may oppose rotation. Managers and coordinators must attempt to balance these real and justifiable perspectives with the need for breadth in work-based learning. The key is following a sound learning plan rather than rotating youth at fixed intervals or making ad hoc decisions solely to reduce tension.

Figure 3 illustrates one way of shifting proportions of time for MET youth to master core competencies and specialize in electronics and electrical engineering.

Figure 3. Time Allocation in an MET Program



- 48 work weeks and 4 weeks' vacation
- Units are shown together for clarity; however, competencies may be acquired in various sequences and combinations.
- Youth rotate through placements selected to teach competencies in four units. See additional MET units and modules in Appendix, p. 84.

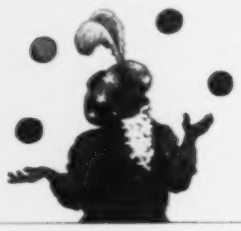
Why Support Projects and Complex Activities?

Youth gain multiple skills and broad knowledge by engaging in increasingly complex activities, by rotating through placements in several different locations within a firm, and by completing projects. The case of Brian LaPorte at The Raymond Corporation illustrates work on both complex activities and projects.

"It took me quite a while to get it to where I could do it by myself."

Over four years Brian LaPorte rotated through several departments at The Raymond Corporation, a manufacturer of electrically powered fork lift trucks, gaining skills in machining, electronics, and engineering design. During his first year he learned to calibrate the guidance system for two truck models, to check the microprocessors, and to use variable power supplies, chart recorders, and multimeters. The procedures he performed required inductive as well as deductive thinking. Through his work he discovered an aptitude for and curiosity about electronics. At the end of the first year, Brian's manager noted on his evaluation that the next step for him was to master "more hands-on troubleshooting." In an interview at the end of his second year, Brian described a complex task he learned to perform:

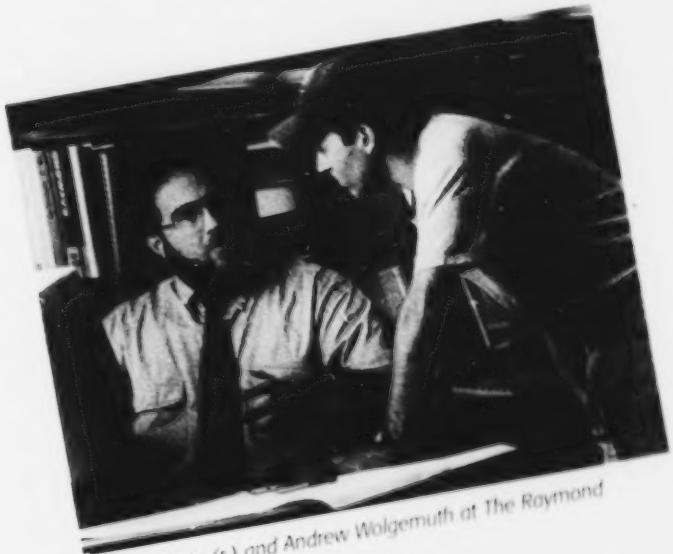
> "At first I worked with electrical boards. 'Wire guidance,' they called it, for the trucks. I had to put the circuit board into the fork lift. Then I had to tune it in to where they go by themselves. They'll steer themselves on this grid on the floor, and you have to tune it [to stay on the grid]. And, you know, it took me quite a while to get it to where I could do it by myself."



Brian LaPorte
The Raymond Corporation and Greene Central High School

Brian spoke about learning concepts and principles he was exposed to by rotating through different placements: "I got more exposure to the hydraulics and learned more about what's going on with a truck. If I see a truck, I can say I've learned this about it, or this." Furthermore, he emphasized that he has acquired an understanding of how the company's final product is made. "I've seen all the steps that the parts go through in order to become one piece." He also put tedious tasks in perspective. He did not like doing some menial tasks such as washing out housings for the hydraulics, but he understood that this was a necessary part of the work: "I guess that's just part of the deal." He appreciated that his manager, John Niles, awakened his curiosity about other areas of the shop and taught him to take more initiative for his learning.

Andrew Wolgemuth managed Brian's learning program in the manufacturing engineering group during his fourth year while Brian was enrolled at Broome Community College. Andrew described Brian's work assignments in an interview as centered on project work: write plans; work on design and drafting; order and process requisitions for materials for special material handling carts; assemble and weld the carts; update a computer database for welders and their qualifications; complete a time study and product flow analysis of various work stations and present results and recommendations; report on active usage of fixtures to assess storage status and recommend dispositions; further develop welding and cutting torch skills. Andrew recommended that coaches regularly establish learning goals through quarterly reviews.



Brian LaPorte (r.) and Andrew Wolgemuth at The Raymond Corporation

What Makes a Good Project?

Project-based learning also assures breadth and introduces youth to all aspects of the industry. By their nature, projects cut across boundaries and engage youth in aspects of work beyond their daily assignments. They foster deeper understanding of some workplace issues.

Participating seniors completed projects that were evaluated on the basis of how well they

- chose a topic and framed an issue related to an occupational area.
- planned a complex long-term project.
- researched an issue using a range of resources.
- benefited others.
- applied academic knowledge.
- exhibited findings.

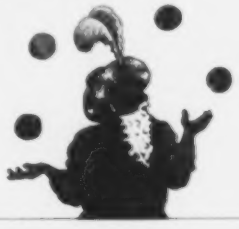
A fall retreat for youth and their managers featured exemplary senior projects from previous years and introduced criteria for producing a good project, how to make a timeline, and potential topics and issues (see Appendix, p. 85).

When asked about their senior projects during the spring, 22 of 24 participants (in the class of 1995) said the experience was challenging because of the depth of knowledge required, the time commitment, the need to speak with people and analyze information, and the public presentation. For some, sharing their work with others and trying to make it useful were particularly inspiring aspects of the senior project.

"It has opened me to more, given me more questions to ask."

"It has opened me to more, given me more questions to ask. What this does for [patients]. Why it is done. Normally, English class and projects, I can whip through them and get them done in a week. I am working on [my senior project] every day in school. I spend my lunch time in the library, no study halls, always working on it. Normally I just [do this type of report for students. I am giving this project to my] boss and adults more than peers. It makes me nervous. I want it to be extra special."

Jennifer Arnold
Blue Cross Blue Shield of Western New York and
Susquehanna Valley High School



Examples of Senior Projects

Create a Procedure Manual for Overloans

Sharon Laude, when a senior at Windsor Central High School, discovered that the procedures for calculating and dealing with overloans at Columbian Mutual Life Insurance Company were inconsistent and difficult to understand. For example, the term "accumulated dividends" was abbreviated four different ways, and important information was recorded by appending handwritten notes to forms in paper files. An overloan occurs when an insurance policy holder has borrowed against the cash value of the policy and not repaid so that the loan exceeds the value of the policy. When this occurs, the company must cancel the policy.

For her senior project, Sharon set out to standardize terms and procedures and to find a secure way of recording actions taken. Her research included a review of cases in which policy holders borrowed more than the value of their policy. Then she standardized terms. She wrote a procedure manual and set up Lotus spreadsheets and standard letters in Microsoft Word that all members of the team could access and personalize. As one member of the senior project exhibition panel wrote, she "changed an entire manual to language any new employee could understand."

Design Electrical Services for a Laboratory

For his senior project at Anitec and Binghamton High School, Blair Dury's coach, Robert Kage, gave him an architectural layout for a new silver analysis laboratory and challenged him to produce a functional design package for its electrical services.

Blair gathered information about power requirements for the test equipment, for the chemical exhaust fans, and for general room power and lighting by reading equipment specifications and nameplate data and interviewing lab technicians and engineers. Design steps included applying the information to size electrical circuits according to the National Electrical Code; specifying the required conduit, wire, circuit breakers, disconnect switches, and so on; and calculating lighting levels. He reviewed all work with the facilities project engineer at each stage.

The design package he presented at his exhibition included architectural AutoCAD plan-view drawings with associated elevation views, schematics, and single-line diagrams, a bill of materials, and standard construction notes and a scope of work. Panel members who evaluated the exhibition commended the depth of his knowledge about electrical power requirements, the numerous skills acquired in executing the project, the connections to academic knowledge and skills, and the range of resources used.

Produce a Videotape on Guillain-Barré Syndrome

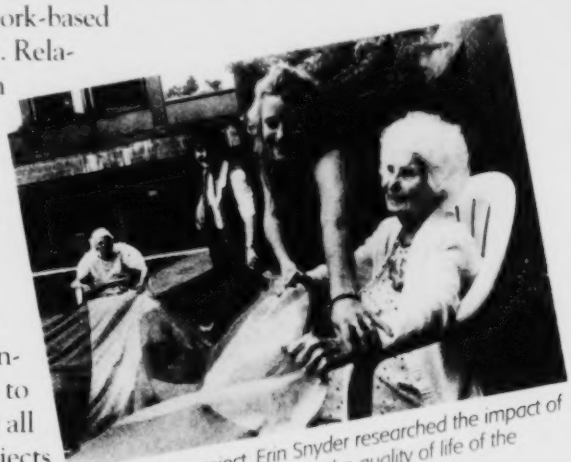
As an apprentice in physical therapy at United Health Services Hospitals and a student at Susquehanna Valley High School, Stacy Potter worked under the guidance of a physical therapist, Jean Marie Haskell, with a patient recovering from Guillain-Barré Syndrome (GBS), a progressive disease of the nervous system that can result in total paralysis.

For her senior project she chose to find out more about the disease, its treatment, and the psychosocial effects on patients. She read the medical literature. She interviewed physicians, nurses, occupational therapists, and physical therapists. She also interviewed the patient and his spouse. She wrote a paper on GBS for her health class.

Stacy invited the patient and his wife to her exhibition when she presented her case study to the panel and had the patient tell the story from his viewpoint. She also showed a videotape portraying physical therapists, herself included, working with GBS patients. While showing the tape, she stopped several times to explain what was happening and why. The videotape will be used to educate health professionals, patients, and their families about GBS.

Conclusion

Workplaces that increasingly require broad and deep knowledge and skills will find participation in work-based learning a wise investment. Relatively simple practices such as including youth in all-firm events and communications contribute to breadth. Two key methods of achieving breadth are rotation and projects. Rotation through multiple work settings and job assignments enabled apprentices to learn a variety of skills and all aspects of the industry. Projects challenged them to broaden their knowledge and to benefit their communities as well.



As her senior project, Erin Snyder researched the impact of new recreational activities on the quality of life of the residents at Good Shepherd Fairview Home.

3. Personal and Social Competence

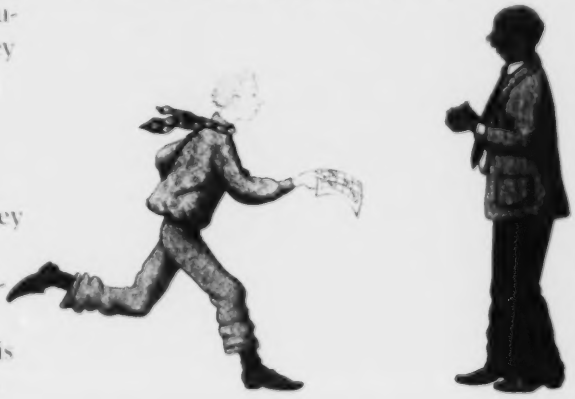
Youth gain personal and social competence in the workplace.

1. Recognize personal and social competencies as key learning objectives.
2. Systematically teach personal and social competence in context.
3. Provide extra assistance to youth who lack personal and social competence through case management.

Bringing young people into a workplace is quite different from hiring new adult employees. Normal hiring processes are designed to assure that new employees already have most of the knowledge, skills, and attitudes required to fill a particular position. Work-based learning programs bring young people who are unqualified for regular employment into a workplace and, over an extended time, qualify them.

Employers frequently say that the qualifications they value most in entry-level employees are not technical skills but such traits as punctuality, reliability, and diligence. They claim that people who have these personal and social skills can be trained in technical skills.

Before employers can teach personal and social competence they must explicitly determine their standards, then formulate appropriate learning objectives and teach young people to achieve them. This is different from using standards to select or dismiss people or, at the opposite extreme, from misguiding youth by excusing them from meeting standards. Employers teach youth what their standards are and how to meet them. Meeting during the spring of the demonstration project's second year, workplace teachers concluded that personal and social competence is generic across all industries and collaborated to produce the Guide to Evaluating Social and Personal Competence, which was used in all three occupational areas (see Appendix, p. 86).



What Should Youth Learn?

The idea of systematically teaching personal and social competence is new and challenging to many people in business. When we interviewed adults who worked with youth in the demonstration project, they said that teaching personal and social competence was more challenging than teaching technical competence. Working with adolescents raised new issues for managers, but we learned that many middle managers were uncertain about how to handle issues related to personal and social competence with adult employees too. Some said they became better managers of adults after learning to deal with youth (see section 5).

Some young people have parents who are regularly employed and who make sure they do their homework and get to school on time, and some have participated extensively in church, community groups, or other organizations. These youth are likely already to have acquired many of the personal and social competencies employers value. Young people who lack these advantages should receive special assistance in acquiring them, both before and during their work-based learning experience. Equal access to work-based learning entails preparation and remedial opportunities for disadvantaged youth. Most employers are not prepared to cope with youth who have serious deficiencies in this realm, but employers in the demonstration project showed great commitment and resourcefulness in helping young people become more mature.

Corinne Kerth (l.) helps Jean Marie Haskell perform rehabilitation therapy at Binghamton General Hospital. Many apprentices said they became more self-confident as a result of learning new skills.

Personal Competence

Personal competence encompasses self-confidence, initiative, motivation, commitment to continuous improvement, and career planning. Learning to act like an adult was a common theme in our interviews with apprentices who spoke of growing self-confidence and often contrasted their behavior at work and in school. Work experience helps youth identify career paths and steps along them.[11]

"You have to be mature."

Erica Anderson (l.) and Barbara Spring

"You have to be at work on time and [take] responsibility for the job that they give you, to get it done in time. You have to be mature and polite. You can't act like you act with your friends at school. When you go to work it's a totally different setting, and you have to go up to their level. When you're at school it's accepted to act how you want, but at work it's not acceptable."

Erica Anderson
United Health Services Hospitals and Union-Endicott High School

"The confidence behind the discipline"

"You're disciplined in a sort of way that you wouldn't be at school. In school you run around like you're a child, but there you are acting like an adult. And you get a lot of discipline from it. I went in as a teenager, with the mind of a teenager. Coming out I think I've developed my mind to almost adult standard.

Interviewer: *And what does that mean for you, adult standard?*

Pretty much living up to what is expected of adults, their social and business manner, the way they think. It has to be almost perfect, not quite, almost perfect.

Interviewer: *You said you had developed discipline, and what has that meant for you?*

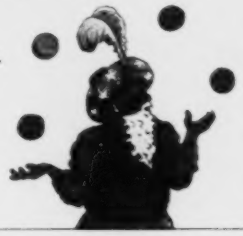
It's meant I've gotten better at what I do. I'm more focused on what I want. I'm more focused on what I'm doing. I have become more confident because I know what I want to do. I know what I'm going to do. I've always had my mind set when I thought of something, but I've never had the confidence behind the discipline."

Lonnelle Egan
The Raymond Corporation and Greene Central High School

"I know more about what physical therapy actually is."

During her senior year Dawn McIntyre made rounds with a physical therapist to work with disabled children at their schools and began to think about a specialty in pediatrics.

"I know more about what physical therapy actually is, so when I go to college, I'm prepared. Physical therapy is not just working in a big gym. A lot of people think that's what it is, like training or sports medicine. It's a lot different than that. You're more involved with the person. There's a wide range. I had to be more professional. It made me think about my career more. And what I wanted to do in the future."



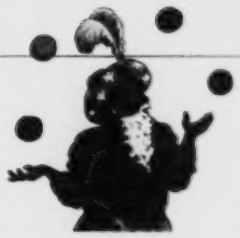
Dawn McIntyre
Lourdes Hospital and Windsor Central High School

Social Competence

Social competence includes learning about organizational systems,[12] meaning the purposes of the organization, its structure, how one department connects to another, the roles of people in the organization, obligations to clients and customers, and how to gain access to information. Work tasks and projects youth undertake can provide insights into how the firm operates. When youth understand how their work contributes to the firm as a whole, they are more enthusiastic and more productive.

Participants learn rules, such as professional ethics, safety, workspace norms, schedules, and appropriate dress. They also learn communication skills and how to work in teams.[13]

"This experience made me care about the company."



As high school graduation approached, Erin Prindle looked back over the past year to select an experience that had been particularly important for her. Interviewing employees from many departments throughout the company for a newsletter article gave her an opportunity to gain a new perspective on the organization and her work in it.

"When I worked as an apprentice, especially when I worked at Human Resources, I had a lot of fun. I did articles for *The Reporter*, the company newsletter, and I was able to interview a lot of people. It got me to open up with the company and see what the company was really like. My first assignment was an article about the new college co-ops. At first I had to locate them. Then I had to find out who they were working for and call them to arrange time when I could interview them. I came up with some questions to ask with help from my coach, Valerie Mahar. I had never interviewed before, and I wasn't really sure what to ask. Then I just interviewed them!"

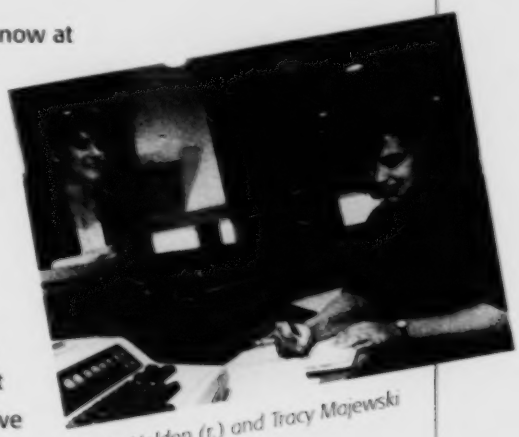
Two and a half years later, when reviewing her interview comments, Erin reflected that the boredom she felt during long periods of filing and working alone during her first year contrasted sharply with her enthusiasm when undertaking activities such as interviewing for the newsletter. She explained why her motivation changed dramatically when she undertook research for her senior project to create an architectural model of the company illustrating how the different departments interrelate.

"I didn't learn much the first year. But that changed in my second year, especially when the senior project came up and I started interviewing different people from all over the company. I interviewed the vice-president of engineering and other important people. This really got me to see the different employees of The Raymond Corporation. I also learned how different departments functioned within the company. This experience made me care about the company, and I became interested in how it worked."

Erin Prindle
The Raymond Corporation and Greene Central High School

"Being on a team"

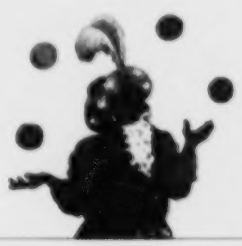
In her senior year Carrie Holden worked in the training department at Blue Cross Blue Shield of Western New York. While she assisted a trainer with preparing packets for seminars to introduce teamwork to employees in the company, she learned how teamwork can help promote productivity and morale.

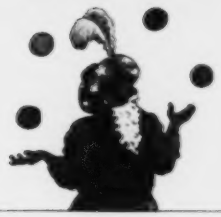


Carrie Holden (r.) and Tracy Majewski

"They're starting a new thing right now at work. It's teamwork, and you think of your department not as just a bunch of co-workers trying to go out and get a bunch of money from insurance companies or train other people. You think of them as just being on a team and there's a goal. You have time in the morning where you talk—we haven't done this yet but they're working toward it—you have five or ten minutes in the morning, which they call the 'Morning Huddle,' where everybody talks about problems they've been having and we get things cleared up. You also learn how to put your personal feelings aside and just work with the person as a co-worker and as a team member. Seeing them with different eyes, I guess you could say. That's a couple of the goals of the teams. And also, just to get people more interested in their work, so they don't feel like they're the only ones having those problems if you start sharing problems among your co-workers. I think it's really cool how everything's changing. I know it's not just our company. It's becoming a more customer-service-oriented business. That's the competition now, you know."

Carrie Holden
Blue Cross Blue Shield of Western New York and
Whitney Point High School





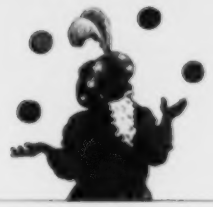
"He knew we needed him."

One coach, Robert Kage at Anitec, described how a youth who saw the importance of a project took initiative and became more self-confident, knowing people depended on him.

"Well, I think one of the most important things was that Blair Dury had to learn that he was important to our group, and that's a critical point. I really was watching for that. We needed him. He was not just a student here. He's working on jobs and due dates, and I needed him to be in and get the work done that he said he could get done. There was a certain point when he realized that he was important, and the group needed him, and he was part of the group. He was doing panel schedules for us. We never had a database for panel schedules. We needed panel schedules desperately. He knew we needed them. And all of a sudden, he just started saying, well when do you need them by? How do you want this done? And it just happened. He was part of us and what we did. That was a crucial point, I thought, with his progress. He knew we needed him."

Robert Kage
Anitec

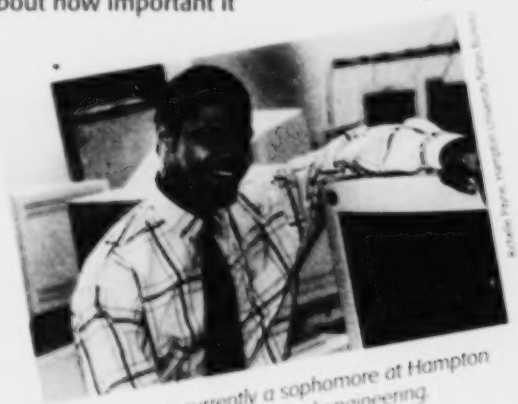
Robert Kage (r.), Blair Dury (c.), and Mark Briggs



"A good outlook for quality"

As a junior, Donald Tolerson initiated conversations with his firm coordinator and managers at the IBM Corporation at Endicott about his desire to learn more and be more productive at work. Consequently, they increased the level of his work on the manufacturing line and in engineering during his senior year, and he began to see how his personal and social skills would enable him to do a good job in a high-performance workplace.

"Being on a manufacturing line definitely taught me a lot of discipline, about being to work on time, about how important it is, and getting my job done. Being where I am now is teaching me to have a good outlook for quality. It's showing me how well-rounded you have to be to do a certain job sometimes and [how] to interact with people. I'm always calling up engineers, asking them questions about blueprints, their quality plans, and it's made my communication better. A lot of it is knowing how well I have to know my job in order to do a good job."



Don Tolerson is currently a sophomore at Hampton University majoring in electrical engineering.

Donald Tolerson
IBM Corporation at Endicott and Susquehanna Valley High School

When Is Case Management Necessary?

Some youth have difficulty meeting workplace expectations. For example, poor health care may result in frequent absences. Others may simply fail to understand what is expected and why they should comply. In such instances, convening a small case management meeting of advocates for the youth might contribute to understanding the problem and developing strategies to resolve it.

Participants in the demonstration project's case management meetings typically included the youth, parents, a school counselor and teacher, the firm's program coordinator, and one or more coaches or mentors. Resolutions included finding a tutor to help with course work; opening communication channels among parents, youth, managers, and school faculty; clarifying expectations and assumptions about behavior; clarifying the roles of different adults; accessing medical care; making choices to balance commitments, such as a second job and extracurricular activities, with project participation; and accommodating a youth's personal problems. One youth decided to withdraw from the program after such a session; in other cases the partners found a way for the youth to continue. When poor health, family problems, and other factors interfere with a youth's performance, the adults involved in managing the case may need to find additional resources, such as a community health clinic or a social agency. Employers' EAP (Employee Assistance Programs) can be extremely helpful in such cases.

Conclusion

To become productive workers, young people need to learn how to do a job but also how to behave at work. Youth jobs and other less intensive types of work-based learning can teach such basic behaviors as getting to work on time and following instructions. Youth apprenticeship and other more intensive types of work-based learning also teach higher-level personal and social competence such as teamwork, responsibility for getting work done right, communicating clearly and respectfully, and asking questions. Young people who acquire the personal and social competence they need as workers are also capable of assuming such adult roles as active citizens and responsible parents.

4. Expectations and Feedback

Workplace teachers convey clear expectations to youth and assess progress toward achieving them.

1. State expectations in advance for behavior and learning.
2. Regularly monitor and document acquisition of competence.
3. Provide feedback on progress to youth, school, parents, and firm.
4. Encourage youth to assemble a portfolio.
5. Eventually use industry-wide standards to provide portable credentials.

Evaluation notebooks, which list technical, personal, and social competencies, are the most detailed statements of workplace expectations and document their attainment. But young people need to know what those expectations are before they enroll in a work-based learning program.

Stating Mutually Clear Expectations

Postion descriptions explain the nature and conditions of employment (see Appendix, p. 87) and outline associated career possibilities and educational requirements. Working with representatives of workplaces and schools, we developed a Mutual Expectations Agreement, which describes in detail the roles of the key players: employers, schools, apprentices, and parents (see Appendix, p. 88). Ideally all four parties sign the agreement at the beginning of the work experience, following a discussion of its contents and of other initial expectations. Work-based learning makes demands on employers that they do not ordinarily face. An agreement helps to spell out expectations without being legalistic.

After learning that several participants were working at part-time jobs in addition to participating in the project, we added specific language to the Mutual Expectations Agreement explaining whether and how much additional paid employment they would be allowed. This concern flowed from two sources. First, although we found that some particpants were able to work a remarkable number of hours and still maintain both their project responsibilities and their grades, some experienced high stress as a result and began performing poorly at work or in school. Second, according to New York State law, an employer of minors is responsible for preventing excessive hours even if the minor has more than one job. Our employers could find themselves in legal trouble if youth worked more hours than the law allows, even in two separate jobs.

Evaluating Learning

In addition to detailing employers' expectations for what youth will learn, notebooks that list technical competencies serve as a record of youths' progress and a means for coaches to communicate with youth, teachers, and parents.

YOUTH WORK

Youth Apprentice Technical Competence Log MET CORE

Documentation

MODULE

DEPARTMENT	WEEK#	MANAGER SIGNATURE	APPRENTICE SIGNATURE
Manufacturing Engineering	9/24-10/1	Mike Walters	John Smith

Date and rate competence

Exceeds requirements, **Meets** requirements, Does **not** meet requirements

Skills	APPRENTICE			MANAGER		
	Exceeds	Meets	Not	Exceeds	Meets	Not
1 Organize work tasks		✓			✓	
2 Meet productivity standards		✓			✓	
3 Review work for accuracy		✓			✓	
4 **Technical Report Writing** (wrote analysis & summary of recommended next work cell improvements)		✓			✓	
5 **Record Keeping**						
6 Process invoices						
7 Verify vendor statements						
8 Track parts through manufacturing process (post, label)		✓			✓	
9 Report whether rates attained		✓			✓	
10 **Quality Systems**, e.g., Statistical Process Control						
11 Plot process parameters on SPC charts. List types						
12 Wrote process routings for shear, laser & drawing		✓			✓	
13 Calculated weights of raw mat'l & split & p.t.'s		✓			✓	
14 Generated step orders & followed per routing		✓			✓	
15 Organized & generated labels for low volume tooling		✓			✓	
16 Record defect data on SPC charts						
17 Understand SPC principles						
18 **Understand process flow**: sequence, database access						
19						
20						

http://www.human.cornell.edu/youthwork/pools/notebook/metlcorcldocument.htm

One manager listed additional competencies, expanding the Documentation module found in the MET core unit. The youth and manager agreed in their ratings.

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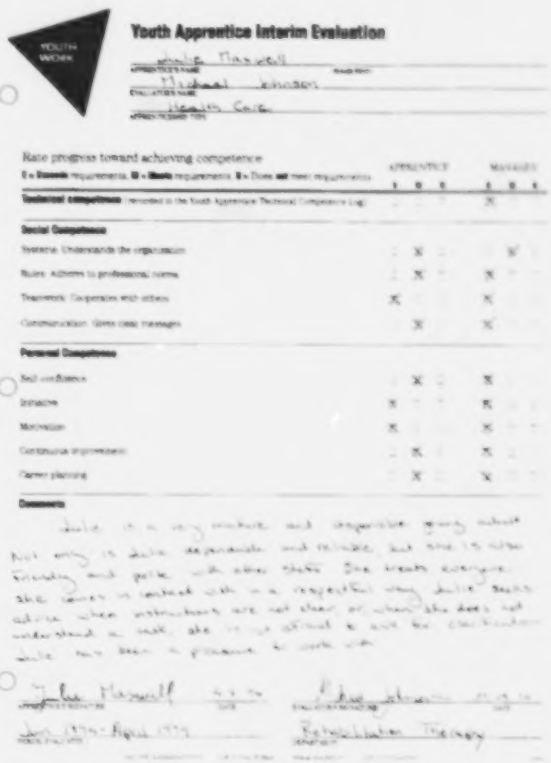
Notebooks substantiated the schools' granting of academic credit to youth for work experience. Many coaches and managers added competencies to modules in the notebooks and drafted new modules when evaluating youth. Cornell staff incorporated these revisions, expanding the number and content of the electives and modules. Despite the effort expended on all sides, not all youth were evaluated regularly. The notebooks may have seemed cumbersome and complex to some coaches and managers. There are trade-offs between comprehensiveness and ease of use, between customization and universality, and between specificity and brevity.

Coaches promote learning by monitoring youths' acquisition of competencies and giving feedback. Youth then know where they stand and how well they measure up. Monitoring also promotes steady progress. Sometimes youth will stay in the same place too long, working productively and often happily but not learning anything new. Lack of progress might indicate a need for a new placement or for more challenging responsibilities in the current placement. To address this need, managers and firm coordinators designed a Youth Apprentice Interim Evaluation to provide timely feedback to apprentices, parents, and the school, as well as for the next placement within the firm. Unlike the notebook, which is a comprehensive permanent record, the interim evaluation is an update intended primarily to foster communication.



Youth Apprentice Interim Evaluation

http://www.human.cornell.edu/youthwork/ptools/int-eval.htm

This youth was less satisfied with her social competence than her manager was.

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The following excerpts from evaluations illustrate how managers gave positive feedback and noted areas needing attention.

"Needs to be a little more assertive"

"[She] does well with assigned tasks and tasks she's used to. She tends not to seek other things out when things are slow. I think [she] needs to be a little more assertive."

Health care coach

"An excellent communicator"

"[She] is an excellent communicator. She'll stop and ask for help when she isn't sure but isn't afraid to try things on her own. She does an excellent job of deciding when to stop in the process, allowing for quick recovery if a problem had occurred."

Manufacturing and engineering technology manager

"Be more spontaneous"

"[She] is a friendly but very quiet young lady. Her interest in her surroundings and in the health care field is evident. She has been conscientious in her approach to assigned tasks and has accepted responsibility for her actions. [She] should be encouraged to be more spontaneous in her interactions with her co-workers and patients (to relax). I feel she has a lot to offer and will 'blossom' when she feels more comfortable in her surroundings."

Health care manager and coach

Some employers in our demonstration project preferred to use their standard evaluation procedures with youth. This practice treats youth like other employees, which is usually good but runs the risk of evaluating youth primarily on the basis of job performance rather than learning. In one case youth became demoralized when they received low scores on performance evaluations that were designed for experienced adult workers.

Credentials and Portfolios

Another reason for documenting learning is to substantiate credentials, which are a critical component of work-based learning. Yet no institution can unilaterally issue truly portable credentials. Educational and occupational credentials open career paths for their bearers only when the institutions granting them are accepted as legitimate and the criteria used in granting them are well established. Schools and colleges are reviewed by accreditation bodies for this purpose. State and professional certification boards govern the granting of credentials in medicine, law, and other professions. Journeyworkers' papers granted to registered apprentices testify that they have met criteria established by unions or state or federal departments of labor. State licenses attest that barbers, hairdressers, plumbers, and electricians have proved their mastery of health and safety issues in those occupations.

Ultimately, work-based learning programs must rely on comparable institutions to legitimate the granting of portable credentials. A demonstration program, however, cannot accomplish this goal because of its small size and limited leverage. Credentials are portable only when they are widely recognized, which nearly always means that they are developed and approved by a broad coalition at the state or national level. Several industry groups are currently developing occupational skills standards, and a National Skills Standards Board has been established. These efforts are steps in the right direction, but years may pass before widely accepted standards and credentials are available for more than a few occupational areas. In the meantime, local and regional standards can communicate to young people what it takes to get a job and to educators what employers expect of schools.

In the absence of standards and associated credentials, young people are best advised to build portfolios documenting their competencies. The use of portfolios as evidence of learning is gaining momentum in secondary education in reaction against the limitations of conventional grades and test scores. Many colleges are willing to examine students' portfolios instead of or in addition to their transcripts and SAT scores. The issue for work-based learning is to create a portfolio that will be manageable and convincing both to prospective employers and to postsecondary educational institutions. Young people could include completed evaluation notebooks, project reports, letters of recommendation, selected work samples, a résumé, and a school transcript in their portfolios. A "certified résumé," listing experiences and competencies and signed by a manager, would be useful by itself and as part of a portfolio.

Conclusion

Managers must establish clear expectations and continuously monitor young people's performance against those expectations. At the same time, young people and their parents have a right to know what to expect from their employers and to demand high-quality work-based learning experiences. Frequent and open communication is the most certain means of assuring mutual satisfaction, but more formal devices such as a mutual expectations agreement, evaluation notebooks, and interim evaluations are also essential. Documentation of progress substantiates the granting of academic credit and occupational credentials.

Formality and regularity are highly desirable in expectations and feedback, but supervisors must be protected from overly complex and time-consuming evaluation and reporting forms. For now every program must seek its own balance. Ultimately, industry-wide standards and credentials will be desirable.

Mike Chambala gives feedback to Andrea Koberlein at United Health Services Hospitals.

5. Teaching Roles

Youth learn from adults with formally assigned teaching roles.

1. Assign clear teaching roles and responsibilities to a coordinator, managers, coaches, and mentors.
2. Authorize teaching roles in job descriptions and performance assessments.
3. Orient, train, and support adults who teach youth.

The greatest investment that employers make in work-based learning is time devoted to teaching young people. This would be a substantial investment if adults and youth were paired off one-to-one, as apprentices historically were with independent master craftsmen. Work-based learning as conducted in the demonstration project, in which youth rotate among several departments of a sizable firm, requires that many adults work with each youth. We have records of 251 different adults in 11 firms who worked extensively with the 100 youth in the project; many of them taught more than one youth. This is a low estimate of the ratio of adults to youth because we know many other adults were also involved. All adults engaged in any type of work-based learning program need some basic information about the program and the youth, which requires communication, orientation, and continuing support.

We labeled four critical teaching roles at the workplace: *coordinator*, *manager*, *coach*, and *mentor*. Most adults interviewed (65 of 70) described interacting with youth in more than one role, such as coaching and mentoring or managing and mentoring. More than one adult might play the same role for one youth. The point of distinguishing the four roles is to assure that all are attended to and to promote appropriate orientation, training, and communication.

Design a Multi-Year Plan

Working with department managers and the workplace's strategic planning team, the coordinator designs a multi-year learning plan that delineates a career path with various branches, goals and objectives for learning, core and elective competency units, a rotation plan, and desired academic degrees. The coordinator also designs field trips and job shadowing for potential youth employees. In some workplaces, especially in the public service sector, unpaid internships and service learning are appropriate forms of preapprenticeship work-based learning.

Link to Strategic Planning

Work-based learning can thrive only if it is aligned with a workplace's strategic plan for its workforce. For example, work-based learning might contribute to such strategies as increased cross-training, upgrading workers' skill sets, establishing self-managed work teams, and creating a learning organization.[14] A coordinator advocates for the inclusion of work-based learning in the firm's strategic plan and assures that it supports that plan.[15]

Recruit, Orient, and Support Adult Participants

The coordinator encourages participation by managers and their departments and provides staff development opportunities for all the adults who work with the program.

Oversee Rotation

Following the learning plan, the coordinator schedules youth in participating departments. The coordinator reviews young people's learning progress with managers at each stage.

Facilitate Communication

The coordinator is the hub of a communication network that includes the workplace, youth, schools, and families. The coordinator collects and distributes young people's evaluation reports, calls and facilitates case management meetings as needed, and maintains communication with the larger system, participating in planning and helping with training and program development.

Being a coordinator: "It runs the gamut."

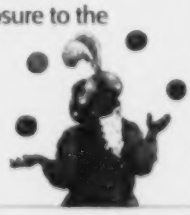
Valerie Mahar described her responsibilities when she was coordinator of the demonstration project at The Raymond Corporation.[16]

"I oversee the activities of the apprentices, the mentors, and coaches. I work with the department managers to come up with new ideas, to continually expose the apprentices to challenging and interesting work assignments. I also assist the youth with such things as filling out college financial aid forms or helping them with work or personal issues and recommending they use the EAP [Employee Assistance Program]. So it runs the gamut.

Valerie Mahar (r.) and Beth Oliver

One of the challenges we had this year was that a couple of key departments were not participating in the rotations—Accounting, Drafting, and Design. And we really felt that absence. The reason they didn't get involved was because they were making major systems changes within the departments. As a result the students had to rotate into departments that collectively were not as challenging, such as the mail room, the reprographics group, and the electrical subassembly area. And we continued to hear issues about some of those areas. For example, they were limited in their exposure to experiences in electrical subassembly; it's very repetitive. So I worked with the managers to design a program for this last rotation to include two assembly areas in one rotation, to better link the subassembly production department. Once the youth learned to build the boards upstairs they would go downstairs and apply the boards to the bigger subassemblies; that type of change makes it more interesting and helps the apprentices to make real connections.

Also we designed our first-year rotations to include areas that better serve as a foundation to learning about the company's people, product, and processes. For example, we include our reprographics group, which prepares the manufacturing blueprints for the factory, and the Inspection Department, so apprentices can get a sense of 100 percent accuracy versus 75 percent and how important it is to *make it right* the first time *before* they are assigned to the manufacturing area. The mail room is a very good first-year rotation because the youth get exposure to the different departments in the company, and they become familiar with the people and the layout of the organization."



Valerie Mahar
Formerly of The Raymond Corporation

A multi-year program with a planned learning sequence requires central control and coordination within the employing firm, in contrast with an ad hoc work experience for individuals. Valerie Mahar's statement illustrates what coordinators do and how they must constantly modify program design in response to changing departmental needs yet at the same time adhere to the basic goals of providing breadth and depth.

Managing **Work-Based Learning Programs in Departments**

Supervise Learning in a Department or Unit

In a decentralized structure, which we found to be nearly universal in our eleven firms, department managers make many of the critical decisions about what youth do and who works closely with them. The manager and coaches decide what youth will learn within a department (or comparable unit), which work tasks will enhance their learning, and in what order the tasks should be presented. Managers also review the learning progress of youth and whether the assigned tasks enable them to achieve learning objectives, to contribute to the team's productivity, and to experience continuous learning and challenge.

Assign Coaches

The manager may coach directly or assign other adults in the department as coaches. The manager chooses adults who are sensitive to and interested in youth and makes sure that they understand the program. Coaches must grasp the principles underlying a work-based learning program. They must also be competent workers.

Organize Assessment

The manager coordinates assessment of youth within the department, especially in cases where youth have several coaches.

"A development tool"

Robert Jensen described his management role as supervising a coach and using the demonstration project as a tool for staff development.

"I actually find it very challenging. I wish I could have been a coach. I would have liked to have been one step closer, but in my position it's becoming more and more difficult. So I've been working through Kevin McMahon, who's a coach. Kevin has adapted to the program very well. He's certainly a very busy person. I give him a lot of work to do, and this adds to his workload, particularly when a new apprentice starts with the program. But he's also come to appreciate the other things he gets out of it, for example, an extra pair of hands, if you will. I don't mean that in a negative sense. Kevin's able to concentrate on, let's say, a more creative problem, one that requires his expertise, and he can count on the apprentice helping him with some of the routine things, getting samples prepared for the next step. So it helps his productivity. It's a development tool for Kevin in working with other people. And I think it strengthens his technical ability because, as you well know, the best way to learn something is to teach it. So Kevin is forced to really know what he's talking about, because now he has to teach young people what's in his head. I have seen a change in Kevin's personality and knowledge and confidence in his knowledge as he's gone through the program. So as a manager I have been rewarded that way. That was part of my plan, and it worked as a development tool for Kevin."

Robert Jensen (r.) and Kevin McMahon

Robert Jensen
Antec

Demonstrate How to Do a Task While a Youth Watches

While performing the task, the coach points out important features and checks the youth's understanding by asking questions and encouraging the youth to ask questions.[17] (Reciprocal questioning is also part of the other functions.)

Explain How to Perform the Task Correctly

Coaches may explain while demonstrating or at another time. The explanation sets out performance criteria, points out what problems are likely to occur, and indicates possible problem-solving strategies.

Explain Why a Task is Performed in a Certain Way

Coaches explain why the task is performed according to certain specifications, provide information about the business management or scientific principles underlying the procedure, and explain how the task relates to other tasks.

Monitor and Critique the Youth's Performance

While monitoring the youth's performance, the coach gives clear and immediate feedback. Although monitoring and feedback are continual, the interval between instances increases as the youth gains competence, and the coach encourages the youth to monitor his or her own performance and to seek help when difficulties arise.

Model Problem Solving

Coaches are responsible for teaching youth to perform routine tasks and for fostering their understanding of what they are doing and why and their capacity to cope with nonroutine events. "Thinking out loud" is the best example of modeling problem solving.

Mentoring **Youth on Personal and Social Behaviors**

Initiate Youth to the Workplace Culture

When they engage in work-based learning, young people enter a new culture with its own rules, conventions, and norms. A mentor's explanations about the culture of the workplace facilitate the young person's adjustment to the work setting.

Advise Youth on Career Directions and Opportunities

A mentor might describe the hierarchy in an occupational area and explain the educational requirements associated with each step.

Help Resolve Problems

A mentor might help a youth resolve a problem with a manager, with school, with family, or with peers.

The term *mentor* is widely used for the role we call coach. We prefer to reserve *mentor* for someone in a quasi-parental relationship with a youth.[18] By this definition, a coach can be assigned, but a mentor must be discovered. Coaches and mentors are often the same people, but the coaching usually comes first, with mentoring evolving as the relationship deepens. One reason for distinguishing the roles is that studies of mentoring in business have demonstrated the advantages of having a mentor who is not one's supervisor.

"I've learned how to word things."

Kathy Rothemeyer, a coach in a hospital laboratory, described how she tried to improve a young person's demeanor in the workplace and, in the process, improved her supervisory skills by working on her mentoring techniques with Barbara Spring, a manager.

"I guess I've learned how to word things. It all depends on how you speak to a person and what choice of words you use as far as them feeling like I'm trying to tell them to do something or trying to teach them to do something. That's something that I've learned on the job here."

Kathy explained that she had a problem when she corrected the behavior of one youth, who then seemed to be upset. She conferred with her supervisor, Barbara, who assured her that she was right in correcting the behavior but suggested that her choice of words and the way they were presented might have been irritating and proposed a different way of speaking with the youth.

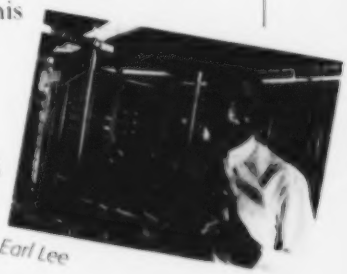
Kathy Rothemeyer (r.) and Stacy Gorman

"It's important because nobody likes to be told what to do. They like to be taught. They like to feel that they can do their job without somebody over them all the time, as long as they're doing what they're supposed to be doing. And if they're not, they need to be told, but in a learning way."

Kathy Rothemeyer
United Health Services Hospitals

"I put it on the table and deal with it."

Earl Lee, a manager at IBM Endicott, explained in his interview how he managed Don Tolerson's work and learning, and how his coaching evolved into mentoring. As a *manager* he designated areas in a large department where Don would work. As a *coach* he insisted on high standards in work products. The intensity of the relationship that resulted led to the apprentice accepting him as a *mentor* who could teach him workplace rules and advise him about his career path and counsel him about his social life.



Earl Lee

Managing

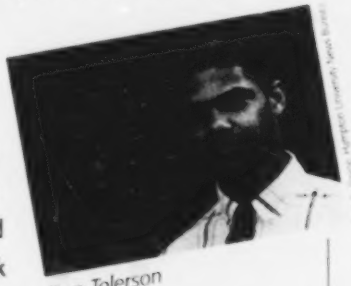
"When I first brought Don in, one of the key things I wanted to do was expose Don to as much from an engineer perspective as I could because Don had told me his career goal was to be an engineer. But he didn't understand whether he wanted to be an electrical or mechanical engineer. [Earl describes Don's assignments in computer-aided design and inspection of new purchases.] By the time Don left there he was actually programming one of our most sophisticated tools down in the receiving inspection area. It helped him to understand what engineers did from an electrical standpoint and also the different types of jobs that they could hold after receiving those degrees. From a management standpoint I wanted to get him to understand that an engineering manager didn't necessarily deal with math and drafting boards and that type of stuff all day. I had him follow me around, shadow me around, to a few meetings to understand that I dealt with the finances of the corporation as well as I did the engineering stuff. So I think that was an eye-opener. He realizes that it helps to take a course in accounting also."

Coaching

"On Monday mornings we had a one-on-one meeting. I told him what we should try to do with the project and then I would give Don say a week or so to do some things with it and he would walk back in with his outline—this was what he thought he wanted to do. And I basically had Don justify that outline. I could have pretty easily told Don, 'This is what I want you to do.' But I thought it was important that Don got out of this being able to rationalize and justify why he made the decision he made. What I was really trying to get

out of him was problem solving, critical thinking. Whenever he came to me and he was at a road block and didn't know where to go, I would ask him, 'What do you think you would do?' And what I wanted from him were two or three different alternatives because if he understood the problem and he understood the options he had, then we could go down and jointly evaluate and analyze each option. And that's the way we went through things."

Mentoring



Don Tolerson

"When Don ran into problems, let's say in school or on the weekends, our relationship developed to such a point that he was sharing those things with me too. And I would ask him, 'Why'd you do this and why'd you do that?' I think after we got through talking there were a lot of cases where Don would say to me, 'Yeah, I know. Didn't make much sense, did it?' So he was able to determine that. I didn't tell him.

One of the things I saw that Don was somewhat slack on was discipline. When I would set up a meeting with Don he thought it was okay to show up late. I know one time for sure he showed up late to a meeting and I wouldn't meet with him. I told him he had lost his slot. I told him, 'We have a time schedule, and you weren't there.' And I said, 'Not only were you not there, you didn't call me.' I think that was the last time he was late. And I'm hoping that carries over into school, into the next job he might have. There were a few times when I would proofread and then I would make corrections. He brought me the copy the next week and I noticed some of the corrections I had given him had not been made. And we got into a discussion about why he was wasting my time.

I put it on the table and deal with it, okay? Because I think if I allow him to get away with it here he might have felt going to college he could slip, slide, and skate, or do what I call a Peggy Fleming—try to skate through. And I felt that I needed to be firm with him but at the same time be fair. For the most part I think Don appreciated it. And I could tell he appreciated it because as our relationship evolved and the work relationship evolved I noticed that he was able to share more and more with me some other things that were going on in his life too. So I know that I did not really turn him off. I think it strengthened our relationship because the bottom line is that I think he felt that I had his best interests in mind. I was trying to prepare him for what he had to deal with in the future."

Earl Lee
IBM Corporation at Endicott

How to Support Teaching Roles

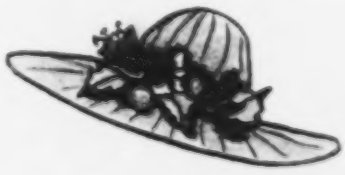
Teaching youth is a form of staff development for adults (see Appendix, p. 90). Adults become more self-conscious about their own knowledge and learning; they gain experience in managerial roles. In view of the magnitude of the employers' investment, this is a critically important benefit from participation in work-based learning. If work-based learning enhances staff development in addition to yielding highly qualified future workers, the investment will be more readily and visibly justified.

Authorize Teaching

Even in small firms, where people typically perform several roles and readily share responsibilities, work-based learning must be treated formally, explicitly assigning teaching roles and responsibilities to coordinators, managers, and coaches and authorizing adult workers to perform these and the mentoring role (see Appendix, p. 91). Managers should write the performance of these teaching roles into job descriptions and specify that coaches and others devote a certain percentage of their time to these tasks. Authorizing these teaching roles in job descriptions and performance assessments moves the firm forward on the path toward becoming a learning organization. It is not enough to bring young people into a firm and expect adults to make time for them around the edges.

Provide Staff Development

Throughout the demonstration project's four years, coordinators, managers, coaches, and mentors participated in workshops that addressed various issues and challenges. During the fourth year the coordinators, under the leadership of Chris Powers, then coordinator at the IBM Corporation at Endicott, helped plan two workshops: a retreat for participants and a seminar on adult teaching roles. Issues for coaches, managers, and mentors involved boundaries and responsibilities among these different roles. We wrote fictional case studies based on reports of problems encountered at the work sites (see training section of World Wide Web: *http://www.human.cornell.edu/youthwork/*). We encouraged the adults who attended the seminar to use the cases as training tools with colleagues who were unable to attend. This "train the trainer" approach seems the only efficient means to reach the many different adults who teach youth. Training is expensive to employers because it is done during the working day.



Conclusion

Work-based learning prepares young people for employment, but it also has a profound social function: it reconnects adults with youth. As they become adults, young people need role models and confidants who complement their parents. They learn from performing technical tasks, but they learn in the context of relations with significant adults who encourage, inspire, and instruct them.

The most satisfying result of our demonstration project is that it showed how adults are able and willing to be coaches and mentors for youth. Some, like Earl Lee, are naturals; all they need is an opportunity. Most others are fully capable of performing the roles with a modicum of orientation, training, and support. Recognizing that "natural" mentors will readily perform some or all of the responsibilities we have outlined even in the absence of formal job descriptions and training, we believe it is useful to distinguish the roles of coaching, mentoring, managing, and coordinating and to provide orientation, training, and support for the adults who perform them. The challenge is to help large numbers of adults gain the competence in teaching youth that some already have.

Work-based learning programs for youth must be accompanied by opportunities for adults to become competent at teaching youth. Happily, they also become more competent as managers of adults, providing a double return on employers' investment in human resources. Learning organizations for youth are also learning organizations for adults.

Bill Balbuena of Lourdes Hospital coaches Tamie Hudy as she studies sections of anatomical parts. Examining these organ systems will help her better understand what she sees under the microscope in the anatomical pathology lab.

6. Academic Achievement

Youth achieve high academic standards.

1. Work closely with schools and postsecondary institutions to set high academic standards.
2. Specify courses and degrees related to the career areas.
3. Open multiple options for postsecondary education.

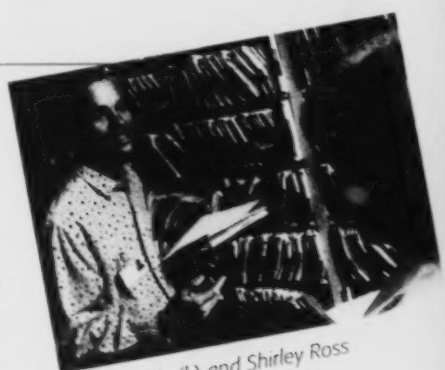
If the distinction between head and hand, between academic and vocational education, was ever valid, it is no longer. Increasingly jobs that pay well require a combination of knowledge, communication, problem solving, and technical skill that sounds like a classic definition of the well-educated person. Schools, in turn, must undertake fundamental reforms in at least four areas: setting high academic standards; creating effective advising systems; linking school-based learning to work-based learning; and allowing flexible schedules.

Promoting Higher Standards

Employers can promote higher academic standards as citizens through membership on school boards and their committees and through public advocacy. They can also do so by clearly stating their expectations regarding the academic achievement of their employees, selecting youth for work-based learning (and other employees) based on those expectations (especially reviewing transcripts of applicants), monitoring youths' progress toward meeting their expectations, advising about courses to take, and offering tutoring if necessary. At the postsecondary level, some employers provide scholarships, a benefit that is especially valuable in states like New York where community college tuition is high.

High school students hoping to make rewarding careers without graduating from four-year colleges must enroll in courses previously considered appropriate only for those bound for selective colleges. Social studies and English courses are required in all four high school grades. The critical question for participants is whether they enroll in optional science and math courses in grades 11 and 12. Youth in all three occupational areas need college preparatory mathematics. Those in health care and manufacturing and engineering technology also need science.

"I'm satisfied but not that satisfied in myself."



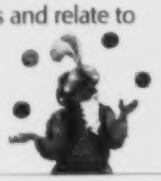
Avion Fields (l.) and Shirley Ross

Avion Fields started taking higher-level science courses when teachers who knew he was in the demonstration project urged him to do so. He regretted not doing it earlier.

"I'm satisfied but I'm not that satisfied in myself. I wasn't that focused in the ninth and tenth grade. I was not taking [my career interest] that seriously. This year I'm taking Regents [college preparatory] chemistry but I could have been taking Regents physics.

The apprenticeship is good for another reason. It puts me on another level. I have a couple of sets of friends at school. I have a set of friends that I goof off with and another set I talk to about going to college. I can also talk to adults and relate to them. I can talk about work and things. I feel more mature."

Avion Fields
United Health Services Hospitals and Binghamton High School



Work-based learning can thrive as part of a larger education reform process only if it fosters high achievement for all. Far from being a less rigorous mode of learning for the academically ungifted, work-based learning depends on the movement to abolish basic or general courses and to raise the academic content of vocational courses to the level of college preparatory courses.[19] A few graduates found they were unprepared for the courses in community college that would qualify them for technical occupations. This demonstrates the need for a systematic approach involving employers, educators, and parents. More communication and a stronger advising system would assure that youth know what courses they should be taking in high school to follow their chosen career path. Work experience by itself is inadequate to overcome inertia and lack of knowledge; high academic performance has to be part of the design of work-based learning programs. Employers can advocate even more forcefully than educators for higher academic standards, but they must do so repeatedly and in many ways to overcome the inertia of current practices. They should also recognize that enabling all students to achieve higher standards entails changes in school organization and instructional methods, changes that cannot be made without cost.

In contrast to Avion Fields and others who were "turned on" to school, as a group the participants showed no greater improvement in grades and enrollment in nonrequired math and science courses than their classmates.[20] Participants' grades improved modestly from grade 10 to grade 12, but no more than their classmates'.[21] We conclude that neither grades nor course enrollments will improve as an indirect result of work-based learning; improved academic performance must be a central focus of school-to-work systems and specific steps taken to foster it. The most critical need is for a variety of learning options and instructional approaches, for explicit links between knowledge and application, and for new school structures.

Mike Surace coaches Wayne Horton (l.) at Lourdes Hospital.

Who Advises Youth?

Employers need to emphasize the importance of success in school for successful careers so that youth begin to make connections among what they are experiencing at work, their career aspirations, and their school performance.

If employers specify the courses they expect youth to take, they will send a strong message, but the message will not be communicated immediately to everyone who needs to hear it because it conflicts with deeply embedded beliefs. Many people, including some teachers, firmly believe that students' academic performance results primarily from inherent and unchangeable aptitude. By this reasoning, students enroll in lower-level courses because they lack the intelligence to succeed in more challenging courses, and they, their teachers, and their classmates would be frustrated if they were asked to do more. Many parents, especially those who have not graduated from college, accept the schools' placements of their children in lower-level courses. Even guidance counselors are often unaware that students who have met no more than minimum standards for high school graduation typically need to take many high school–level courses in community college before they can qualify for admission to programs leading to technical associates' degrees.

"I ask them how school is going."

John Niles regularly asked youth he supervised about their schoolwork.

"I try to have a one-on-one every week. I didn't have one this Tuesday because of conflicts. We didn't meet until last Thursday, and we'll meet again this coming Tuesday. I ask them how school is going, any problems, did you get your report card. See, I have a daughter in high school too, so I know about when exams are coming and when the report card should be out."

John Niles
The Raymond Corporation

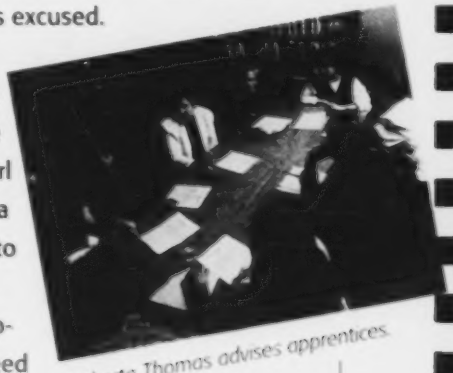
Students need information and advice from a range of sources, including but not limited to school counselors. Parents are and should be their children's most important advisers. To fulfill that role most of them need additional information about career opportunities, including educational possibilities and requirements.

Mentors at work can be invaluable advisers but they also need up-to-date information and the skill to convey what they know effectively. Classroom teachers are also important sources of advice; they can be more effective when they have better information, adequate time, and authorization to act as advisers.

"I'm bringing back something."

Teachers spoke about how their students' and their own participation in the demonstration project had changed their teaching methods and their attitudes toward teaching and students. Roberta Thomas, an English teacher, spoke movingly about the revitalization she felt.

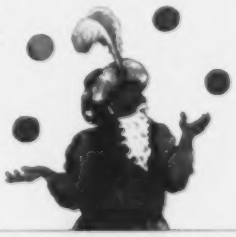
"I went to where Melissa Storti works in the morning. We arranged a meeting so it would be close to when she was excused. And we went to a cafe for breakfast. We sat and chatted about her performance, what she liked, what she wanted to do, and college. We talked a lot about careers and how a young girl in the medical field is supposed to act. It was a very personal connection that I was very glad to have with her, to be able to sit over breakfast with Missy and talk, person-to-person, adult-to-adult, old adult to young adult. You know, I need to get out of the constrictions of the building.



Roberta Thomas advises apprentices.

This is what makes me want to get up in the morning and go to work. Getting out with adults, going to the workshops, talking with other teachers, with coaches, with people in the business world, Cornell people, all of those things make you think that you're actually a professional. And sitting down to a luncheon, a professional luncheon. That helps me. I'm bringing back something to my students and to the rest of the teachers."

Roberta Thomas
Windsor Central High School



Some schools participating in the demonstration project instituted advising groups, giving participants a time to talk over problems they encountered and to discuss ways of taking advantage of their opportunities. Scheduling problems and the absence of a "critical mass" of participants in most schools constrained the effectiveness of advising groups.

Margaret Coffey meets with her advising group at Binghamton High School.

How Can Teachers Link School-Based Learning to Work-Based Learning?

Some students will be sufficiently motivated by their work-based learning experience to adapt to current college-preparatory courses. But students with different learning styles may need courses that vary in methods and duration but teach the same concepts.[22] Work-based learning presented a major challenge and a tremendous opportunity for schools to connect academic learning more closely with the real world, a connection that will benefit not only the students in what have been general and vocational tracks but also college-bound students, many of whom are adept at learning abstract information for tests but unable to use what they have "learned" by applying it to solve real problems.

"It came to life."

Joyce Golden's account of a marginal math student explaining the concept and use of standard deviation helps illustrate the rationale for work-based learning. Her opportunity to visit workplaces and meet with people from business brought a new dimension to her classroom.

"When material can be made meaningful to their everyday life as it is in the workplace, it has some relevance. I had a couple of good examples this year where apprenticeships were a factor in my classroom instruction, and that would not have happened if I had not been familiar with the work environment. One was teaching standard deviation with a student who was doing very poorly in math. I was able to say, 'Gee, I think we use standard deviation in the workplace. I wonder if someone could tell us what that means?' And sure enough [finger snap], it came to life and he explained exactly what a standard deviation was, why it was important to the statistical research of the company, and how he was using it on a regular basis. No problem whatsoever because it was in a meaningful context for him. So that was application for the whole class, but he would not have volunteered if I hadn't known enough to go for it. It was my familiarity with what they were doing and what he was doing that made me able to use that kind of knowledge. Unfortunately, few teachers have had those opportunities."

Joyce Golden
Susquehanna Valley High School

Why Allow Flexible Schedules?

School counselors were very creative about adjusting participants' schedules to incorporate substantial work hours. If large proportions of any school's students began to participate in extensive work-based learning, however, conventional scheduling would quickly become a barrier. Some work-based learning programs have used the European approach of full days at school and at work. This reduces transportation time, which is a serious consideration, but entails special classes for participants. Many schools are experimenting with more flexible schedules, and some of those schemes would accommodate work-based learning much more readily than conventional schedules.

Conclusion

Young people should know while they are in high school what they will have to do to achieve their career goals. If their goal is first to graduate from a four-year college, then it is clear what they must do to get in. But if they expect to begin full-time employment without a four-year degree, most have little guidance about what courses they should take in school and what grades they need to achieve. Teachers and counselors who are oriented to four-year colleges are of little help. When employers publicly advocate higher academic standards and then use those standards to make hiring decisions, they send a very powerful message. When schools reorganize to teach all students, they will help to release human resources that are currently wasted when we define half to three-quarters of our high school students as unable to learn.

Our demonstration project showed that specific institutional practices are needed to communicate those standards and help young people meet them. Courses designed to teach high-level content in engaging ways are one such practice. Schedules must become more flexible to enable work-based learning. Another needed reform is the creation of comprehensive advising systems, including not only school counselors but also teachers, parents, and mentors at the work site. Teachers and counselors will be most effective if they are able to learn firsthand about the academic content of contemporary workplaces through visits, meetings, and internships. Finally, curricula and instructional practices should stress the integration of academic with vocational education and school-based with work-based learning.

Tammy Locke, in health care at Lourdes Hospital, listens to teacher Howard Fisher in an anatomy and physiology class at Binghamton High School.

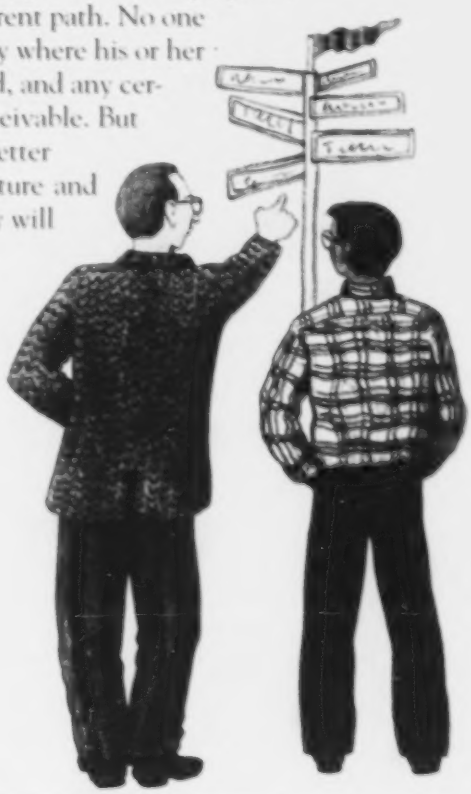
7. Career Paths

Youth identify and follow career paths.

1. Provide career exploration opportunities and information on related careers.
2. Advise youth about career paths, coordinating with high school and college advisers and with parents.
3. Pay particular attention to the post–high school transition.

A career path traces a lifelong occupational journey involving both education and employment, not a single job or even a single occupation. By this definition, some career paths are smooth and direct while others are rough and full of dead ends; some lead to well-paid and prestigious employment but others do not. A path is not a track; it allows for changes in direction and can lead toward several destinations.

A good career path provides a sense of direction and a purpose for academic achievement so that a young person is well prepared even if she or he later chooses a different path. No one has ever been able to predict precisely where his or her own or someone else's career will lead, and any certainty about the future is now inconceivable. But if we can give more young people a better sense of what they can do in the future and what they have to do to prepare, they will be better able to make good choices.



Career Paths after High School and Work-Based Learning

After high school graduation, young people can follow four distinctive career paths related to their previous work-based learning: *continuous*, *redirected*, *exploratory*, or *undirected*. School-to-work systems help youth formulate visions of their career paths and then take steps to reach their dreams.

Continuous

Youth may continue a career path begun during high school (see Table 6 in Appendix, p. 92). Desirable career paths increasingly require postsecondary education; options for people with no more than a high school diploma are shrinking. At its best, work-based learning helps young people set career goals and stimulates and enables them to continue the education they need to achieve those goals (see Table 7 in Appendix, p. 92).[23] While enrolled in community college or four-year colleges, youth may also engage in coherent and increasingly demanding work-based learning related to their education. Some youth may, however, secure full-time employment in the same occupational area directly after high school, having gained sufficient knowledge and skills to perform effectively in jobs that are ordinarily reserved for older adults.[24]

After graduating in accounting from Broome Community College, Kellie Gehres (r.) accepted a full-time job offer at Security Mutual Life Insurance Company. Gerri Benedetto (l.) coordinated Kellie's four-year program at Security Mutual.

Continuing work-based learning in college

Blair Dury is well on his way toward becoming an electrical engineer, having had many supports and opportunities during four years in manufacturing and engineering technology at Anitec. He is also a second-year engineering science student at Broome Community College. He hopes to transfer to a four-year college to continue his studies.

Blair progressively improved his grades in academic courses from a C+ grade level (GPA = 79) in sophomore year to all A's and B's junior (86) and senior (92) years, including A's in both math and Regents-level physics senior year. He went from 26 absences sophomore year to 5 in the junior year and only 1 in his senior year. His firm coordinator noted that in his senior year Blair became more outgoing and self-confident, in part because he interacted with a variety of people in his assignments and had become a very dependable, valuable, and productive employee. The realization that he is an important member of the organization and that others depend on him has been an important step in his personal development. He volunteered to play with his co-workers in a company volleyball league, and his talents led the team to the season championship. He was selected to attend the White House signing ceremony for the School-to-Work Opportunities Act in May 1994. For his senior project he designed the physical layout for a silver analysis lab, including all electrical units.

Blair Dury (r.) and Robert Kage

At the end of his senior year, Blair explained what work meant for him: "For me, it means a chance for college, a chance to earn money, a chance to learn things that I normally wouldn't learn, and a chance to meet new people."

After his first year of college we asked Blair to name the most important adults in his life. He described how each had helped steer him on a career path.

"My parents are two of them. They've always been there when I needed them and they'll go out of their way to help me out. And I'd say one of my teachers, Mr. Hauptfleisch, back from Binghamton High School, got me into technical stuff like engineering and things like that, and I owe a lot to him to get me on track going in the right direction. And I'd say my boss Robert Kage is another person who really helped me out. I mean, it's nice to have a boss who can tell you, you know, 'Go to school. Do the best you can there and then worry about coming to work.'"

Blair Dury
Anitec, Binghamton High School, and Broome Community College

Becoming a professional

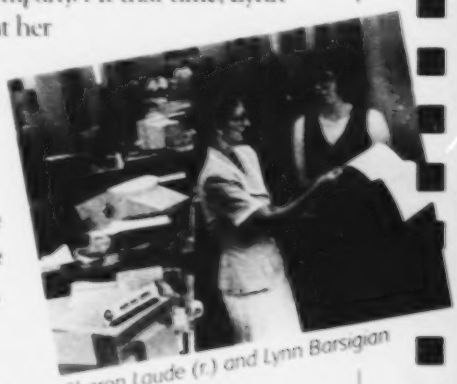
In the spring of 1995, Erica Anderson completed her associate's degree in nursing at Broome Community College, was certified as a registered nurse, and started full-time employment at United Health Services Hospitals in medical surgery. Four years earlier, she had begun her career in health care at United Health Services Hospitals during her junior year at Union-Endicott High School. Her two-year program taught her how to form excellent work relationships with both patients and staff in the outpatient lab for the phlebotomy department, in physical therapy, and in the main lab for the hospital.

Erica Anderson (l.) and Mary Peterson

At high school graduation Erica received a nursing scholarship from the hospital, but she did not qualify for admission to the nursing program at Broome Community College because of a low chemistry grade. Nevertheless, because of her background and strong references, she was admitted that fall. Next spring a faculty member strongly recommended that Erica be sent to Washington for the White House signing ceremony for the School-to-Work Opportunities Act and confessed that she had been skeptical about admitting Erica because of the high dropout rate of students just out of high school, who often lack the social and personal competence required to work with patients. But much to her surprise and delight, Erica showed strength and maturity in dealing with patients and earned a 3.1 grade point average for 18 credits in her fall semester. As part of her scholarship Erica worked as a nurse's assistant every other weekend, on breaks, and full-time over the summer at the United Health Services Hospitals. Erica confided that representing the program at the White House and elsewhere increased her self-confidence.

"We have someone who is fully trained."

After Sharon Laude graduated from Windsor Central High School, she started work full-time at Columbian Mutual Life Insurance Company. At that time, Lynn Barsigian, her coordinator, expressed ambivalence about her immediate entry into the workforce.



Sharon Laude (r.) and Lynn Barsigian

"Because she's getting married next month, she has elected at this time not to go on to Broome Community College. So in that respect we're all disappointed. We kind of feel like the program failed. But on the other hand, it didn't fail because she has really matured, and now we, as a company, have someone who has been here for two years, has gone into a full-time slot, and is fully trained.

We hope she'll learn that education requirements are going up, and she'll have to continue with schooling. That's part of the goal. But it did work for Sharon because she has matured a lot. She wouldn't be here otherwise. There's still more training that needs to be done, but she is light years ahead of someone who is just coming off of the street, even if they have the educational background."

Lynn explained further that one stipulation for her employment has been Sharon's promise to continue her education by taking courses at the company and then to enter a program at the college. This meets the firm's need for highly skilled employees since its restructuring into customer service teams that require cross-trained employees.

"All of our jobs require either an associate's or a bachelor's degree or equivalent work experience. I can think of only two jobs in the whole company that I would hire somebody for straight out of high school with no experience. As a matter of fact, for our customer service jobs, [where Sharon has been placed] we are thinking about increasing the educational requirement to a bachelor's degree. Mostly the people in the customer service area juggle not only a lot of work but also working with the public. Someone straight out of high school would not be as polished as we need them to be if they didn't have equivalent work experience.

The level of technical knowledge that people have to know has increased. There is a higher level of computer expertise that they have to have, in addition to a customer service maturity. Although our insureds and agents are typically friendly, they can be very tough at times. Therefore, good telephone skills are very important. We are getting to a point where we need a higher caliber of person. We are willing to train new hires on the insurance [matters], but the ability to learn, the customer service skills, and telephone skills—you've got to have that when you come here. If you don't have it when you come here, you're not going to get it overnight."

Lynn Barsigian
Columbian Mutual Life Insurance Company

Redirected

Multiple changes characterize adolescence, and redirected career paths are inevitable. Learning what one does not want to do is an important part of choosing a career path; it can add confidence to a new choice.[25] If work-based learning helps young people clarify their career plans, it is beneficial to them even if they decide to move in a new direction. Furthermore, many of the lessons young people learn from work, especially the personal and social competencies, will serve them well regardless of the career area they pursue.

Exploratory

A third possibility is that high school graduates will remain in the exploratory mode seeking a clear direction even after participation in work-based learning. Many parents and career counselors believe this is the best state for teenagers. Our educational system and labor markets encourage delaying commitment to a career. Exploration is common among college students enrolling in the arts and sciences. So long as young people are taking constructive steps while exploring, it is a beneficial state, and getting a solid education is the most constructive step of all. Ideally, youth will first take advantage of the less intensive types of work-based learning for exploration, for example field trips and job shadowing, and later embark on their career paths in high school through the more intensive types, such as cooperative education and apprenticeship, and then continue their career paths in college.[26]

Undirected

The School-to-Work Opportunities Act responds to the observation that young people in the United States who do not graduate from four-year colleges tend to flounder for several years, moving aimlessly from one youth job to another, before finding employment that pays more than minimum wage, offers reasonable security and benefits, and provides opportunities for upward mobility. Young people without college degrees often cannot obtain such employment until they reach their mid-twenties or later.[27] To the extent that participants in work-based learning engage in the floundering that is typical for recent high school graduates, they have not benefited, at least in the near term.[28] The clearest indicator that a graduate who is not enrolled in postsecondary education lacks direction is that she or he does nothing to follow a career path. This person may be employed only in a job that requires no special skills and offers no opportunities for advancement, move frequently from one job to another without making significant progress toward a long-term goal, or spend long periods of time without a job. Having a child or getting married deflected some participants from or postponed their choice of a career path.[29] Illness, family problems, and disabilities also prevented some youth from finding a direction, at least temporarily.

Helping Youth Find a Direction

Continuous career paths are clearly advantageous to young people. When these paths lead back to the training firm, they are also advantageous to employers who make substantial investments in work-based learning. Representatives of the firms in our project stated their belief that young people and the community would benefit from work-based learning even if graduates did not work for them. Nevertheless, employers must eventually see a reasonable proportion of their trainees moving into their workforces if they are to earn a satisfactory return on their investment. We recognized when initiating the demonstration project that participants would have to select an occupational area without an adequate foundation of information and exploration. Therefore, we were pleased that more than half remained in their occupational areas after graduation. This proportion should be much higher in a fully developed school-to-work opportunities system. Three components are especially critical to helping youth find a direction: exploration and information; advising; and financial aid.

Exploration and Information

The different types of work-based learning described above (see page 6) can be conceived as progressively defining a career path. Ideally employers will join in partnership to provide a full range of opportunities for all young people. Over time the result will be that those applying for cooperative education, internships, and youth apprenticeship placements will have previously visited workplaces for field trips and job shadowing. They will be making informed choices based on extensive information and experience rather than using intensive work-based learning for exploration, which is a low return strategy for employers.

Advising

As described in the previous section (see page 55) advising is another critical need that must be made by parents, teachers, counselors, and workplace mentors. These advisers, in turn, need solid information, authorization to perform this role, and opportunities to communicate with each other. Employers who spell out the academic and nonacademic qualifications they require of applicants help to convey to young people the information they need to make sound choices.

Financial Aid

High school students need advice about postsecondary education, including information on the courses required for entrance into specific programs and the dates applications are due. But financial need was the most serious barrier to postsecondary enrollment among participants in the demonstration project. Community college tuition in New York State is unusually high, but even modest charges can be a barrier to young people who must earn substantial amounts of money to help their families. A few employers gave scholarships to successful participants, which is a wonderful incentive and, we think, a wise investment. Providing information about the availability of grants and loans and the process for filing applications can be very helpful for young people whose families are unfamiliar with these matters.

David Winters, Matt Hunt, and Stephanie Alger (l. to r.) talk with Valerie Mahar at The Raymond Corporation.

Conclusion

In 1916 John Dewey wrote,

A vocation means nothing but such a direction of life activities as renders them perceptibly significant to a person, because of the consequences they accomplish, and also useful to his associates. The opposite of a career is neither leisure nor culture, but aimlessness, capriciousness, the absence of cumulative achievement in experience, on the personal side, and idle display, parasitic dependence upon the others, on the social side. Occupation is a concrete term for continuity. It includes the development of artistic capacity of any kind, of special scientific ability, of effective citizenship, as well as professional and business occupations, to say nothing of mechanical labor or engagement in gainful pursuits.[30]

"Work is about being one."

One of our interview questions is posed whimsically to elicit young people's conceptions of work. We ask them to imagine that one day at work an alien from outer space appears and asks them to explain what work is. One young woman, Teresa Shoemaker, replied as follows when first asked the question in the fall of her junior year at Binghamton High School, when she was a beginning health care apprentice at Lourdes Hospital.

"Like I want my work to be fun, I want to love my work. Work would be something that I want to do, something that's gonna get me through life. My work would be helping people. Work is going to the hospital, hopefully saving some lives doing what I love."

Teresa went on to say that she looked forward to working in sports medicine and physical therapy because she was an athlete and physical therapists had helped her. "So if I can help someone do something that they love, then I'll love doing that." We asked the same question at the end of her junior and senior years. The third time, just before high school graduation, she remembered the question well and responded as follows:

"My answer's going to be so different! Like work is something that you have to care about. Like in the medical profession you have to care. 'Cause if you don't care, and you're very removed from it, people know. It shows, and so you have to care, caring and respect—the other people that you work with, your patients, respect for yourself.

Work is a challenge. There's things you have to overcome at work. Like if we had to go up on a floor and do a patient, and then the therapist was scheduled downstairs too. You have to learn how to work around things and to divide your time. It's like pieces of a puzzle, and you have to put them all together. Everything has to come together as one.

Work is about being one. There's so many different departments in the hospital, but after being in four of them you realize how much they rely and depend on each other. Like the nursing staff depends on physical therapy to get their patients up and ambulate them to get them stronger so they can be released from the hospital. Physical therapy depends on the x-ray department, say, to tell them what is wrong with the patient. It just all works together. It's not like individual. Doctors depend on physical therapy and x-ray and the pharmacy. It's hard to define work in the medical profession. There's just too many things that go along with it."

Teresa Shivemaker
Lourdes Hospital and Binghamton High School

These two statements reveal commitment to caring.[11] They also show a developmental progression from simple to complex and from a self-centered view of work as something the youth likes to do toward a conception of work as an inherently social activity that incorporates others—patients and co-workers who deserve respect—and is embedded in a complex, interdependent organization characterized by distinct roles and structures. The shift from work as enjoyment to work as challenge also seems significant. Reference to the medical profession seems important too as an indicator that Teresa has come to identify herself with an institution that is even larger than the hospital. Her ability to talk like this and her awareness that her ideas have changed suggest a growing cognitive capacity and an emerging sense of self, both of which are central to adolescent development.

Without the work-based learning experience, she might have had other experiences and certainly would have matured in her outlook on work and other topics, but typical youth jobs in the United States are unlikely to provide the opportunities for development that her statement revealed.

In our society occupation is absolutely central to identity, now for women as well as men. All young people need a sense of what they might do to earn a living so as to develop their sense of themselves as citizens and family members. As Dewey wrote, "An occupation is the only thing which balances the distinctive capacity of an individual with his social service. To find out what one is fitted to do and to secure an opportunity to do it is the key to happiness" (p. 308). He went on to warn against the simple-minded belief that one chooses an occupation once and for all. Rather, he described the process as continuous, lifelong.

Work-based learning opportunities contribute to that lifelong process, especially when they match young people's needs, beginning with exploration and progressing to gaining technical competence. Employers who teach youth need to make investments consistent with their goals. If they wish to enhance the quality of their future workforce, then they must pay for intensive work-based learning; offering field trips will not be sufficient. The more intensive types of work-based learning need the foundation provided by less intensive types, however. Young people who participate in cooperative education and apprenticeships will be more likely to continue in a related career path if they have previously had the opportunity to explore careers and make an informed commitment.

Lois Edwards coaches David Talomei at Lourdes Hospital on procedures to embed specimens in paraffin.

Next Steps

The experience of operating a youth apprenticeship demonstration project has left us optimistic about the prospects for creating a more effective system to foster the transition from adolescence into adulthood in the United States, a system that uses workplaces as learning environments for youth. The experience has also revealed the magnitude of the task. Following are the steps we see as most critical to success.

Commitment is more than willingness to participate. An employer, for example, might join a school-to-work partnership primarily as a gesture of support to the community but without accepting its aims and its guiding principles. If an employer is motivated by no more than civic duty, then a downturn in earnings will quickly terminate participation. Similarly, if schools are primarily concerned about dealing with students who are not served well by current programs, they are unlikely to engage in the kind of restructuring school-to-work requires, especially enabling all students to meet high academic standards.

The opposite of commitment is rejection, but in many ways straightforward rejection is less insidious than participation without commitment. The greatest threat to the integrity of school-to-work is its nominal adoption, perhaps simply by using the term to describe current activities, without attempting the restructuring that true commitment entails. We see a striking parallel between the kinds of commitments school-to-work requires of schools and workplaces. Restructuring is needed in both schools and workplaces in the following four areas.

Increase the Breadth and Depth of Learning

Schools and workplaces need to accept as a central goal increasing the depth and breadth of learning available to everyone. To this end, employers will promote high-level technical, social, and personal skills by providing work and training in broad career areas. Educators in schools and colleges will become committed to teaching all youth how to think and offer them rigorous courses. Teachers should relate academic learning to the life choices young people face as citizens and family members as well as workers.

Assure Equal Access to Learning

All employees need opportunities to learn high-level skills. Employers should provide career ladders and learning opportunities for all employees, not just for those with college degrees. The School-to-Work Opportunities Act specifies that schools provide some form of work-based learning to all students and abandon the tracking systems that relegate half or more of all students to undemanding courses and limited career prospects. Educators must challenge all youth, advance interdisciplinary learning, modify schedules, and make college entry possible for all students. The new philosophy is that all students can learn if given appropriate opportunities and adequate support.

Assign Staff to Organize and Monitor Work-Based Learning

In both institutions staff should be formally assigned to support young people's work-based learning. Adequate scale cannot be achieved if responsibility for work-based learning is simply added on to other responsibilities already carried by overburdened staff. Employers must commit human resources to coordinate, manage, coach, and mentor youth in the workplace. Schools should expect every faculty member to advise a group of students about career paths and learning and should formally assign a coordinating role to at least one person.

We have quoted many talented and dedicated adults who worked with youth in schools and workplaces. Their statements and their actions demonstrate that putting young people in the company of adult coaches and mentors can be extremely stimulating and satisfying to adults—as it is to young people—if the adults are allowed to teach what they know, express their personal concern, and share their wisdom. Teachers also describe their involvement with people in business and industry and with youth as inspiring experiences. These adults and their counterparts around the country are the best hope for the success of work-based learning.

Maintain Learning Organizations

Ideally, employees are able to learn and use multiple skills, to participate in self-managed teams, and to have access to internal career ladders. This applies to schools no less than to young people's workplaces. Teachers should be active learners, participating regularly in high-quality staff development. Internships in business and industry are a powerful experience for teachers, giving them a clear vision of the academic demands of work. Similarly, employees who have spent time in schools gain a sympathetic understanding of challenges facing educators and how they can help.

Form Partnerships

The demonstration project confirmed that partnership is essential among employers and employees and their organizations, educators and school systems, legislators and government agencies, parents, youth, and community organizations. Once they have committed themselves to the goals of school-to-work, the partners must define their roles and responsibilities and establish a working relationship that enables each to contribute. They succeed when the partners are able to establish a joint strategy, respect each other's needs and strengths, and negotiate with each other to resolve their differences. The partner organizations and groups have purposes, cultures, and structures that keep them separate from each other. Changing a single institution is daunting enough; creating functional partnerships is a challenge of the first magnitude because it requires coordinating changes in several institutions. Institutional inertia and self-protective tendencies are serious barriers. But there is no alternative. None of the partners can succeed alone.

Build a School-to-Work System

No single type of work-based learning is adequate by itself. Field trips, service learning, youth-run enterprises, and other types all increase young people's awareness of their own talents and inclinations and of the opportunities available to them. Youth who enter apprenticeship programs need work-based opportunities to explore careers beforehand. Employers who wish to use youth apprenticeship as a means of improving the quality of their workforce will find that their investment pays off at a higher rate if they first provide young people with job shadowing and other exploratory opportunities. If the investment required by apprenticeship is too great, then cooperative education, internships, and other types may suffice. The goal should be to provide in every community a complement of work-based learning opportunities to meet a range of needs among both young people and employers.

Moreover, in addition to work-based learning, a school-to-work opportunities system includes appropriate and effective school-based learning and multiple connections between the two. Although we have not addressed those components separately, the demonstration project confirmed that work-based learning must be supported by changes in schools

and by an array of connecting activities, as the principles and choices described above make clear.

A system differs from a program. A system is

- inclusive—it has a place for everyone who needs one.
- comprehensive—it addresses the full range of relevant issues.
- integrated internally—its components are closely linked (e.g., school-based learning to work-based learning).
- connected externally—it builds on what comes before and leads on to something else (e.g., school-to-work connects with higher education and with the labor market).
- comprehensible—participants understand it and can navigate through it; parents and other advisers can help.

We do not yet know how to accomplish the goals of school-to-work. Research and development cannot answer all the questions that remain, but it would be unwise to proceed without continued monitoring and testing. Ideally this will be done in a manner and on a schedule that informs practitioners who are designing and operating systems. We hope the principles and choices proposed here will serve as a framework for some of the needed research and development.

The growing disparity between the well-educated affluent and the inadequately educated who struggle to maintain a decent standard of living must be reduced if the United States is to remain a prosperous and secure democracy. Education cannot reduce that disparity without complementary changes in the economy, particularly the labor market. But education—in the form of the school-to-work initiative, and especially work-based learning—is a powerful means of improving the knowledge and skills of the American workforce, which is, after all, most of our citizens. Work-based learning that adheres to the principles we have stated will contribute to but also depend upon never-ending progress toward the promise of freedom and opportunity that is the American dream.

Notes

1. Although we have often described the demonstration project as a Broome County program, The Raymond Corporation and the Greene Central School are both located in adjacent Chenango County.
2. Schools could grant a total of five New York State Regents (college preparatory) credits for participation in the demonstration project: two credits each junior and senior year earned for technical, personal, and social competence; one credit for a senior project.
3. We use the term "employer" to mean the work organization that offers work-based learning to youth. These organizations may be profit-making firms, nonprofit organizations, or government agencies. They are represented by people who, except in the cases of small firms and voluntary organizations, are almost always employees. The School-to-Work Opportunities Act requires that both employers and employees participate in community partnerships, including labor unions and other employees' organizations, a requirement we strongly support. However, we have not attempted in this guide to distinguish sharply between the functions of employers and of employees in creating high-quality work-based learning opportunities.
4. A compelling analysis of German apprenticeship concludes that small firms receive a net gain by training apprentices because they contribute more to production than they cost, whereas large firms invest more in training apprentices and recoup their costs only by retaining apprentices as regular employees for several years after their training has been completed. See D. Soskice, "The German Training System: Reconciling Markets and Institutions," in L. Lynch, ed., *The Privatization of Skill Formation: International Comparison* (Chicago: University of Chicago Press, 1991).
5. See S. F. and M. A. Hamilton, *Opening Career Paths for Youth: What Needs to Be Done? Who Can Do It?* Cornell Youth and Work Program, Cornell University, American Youth Policy Forum, Jobs for the Future, 1994, for a description of responsibilities of the partners in building a school-to-work system.
6. We chose to write about principles rather than a model in the spirit of Ted Sizer's nine principles for the Coalition of Essential Schools. Those principles make explicit his beliefs about what secondary education should accomplish and describe how a high school should operate to achieve those purposes. He eschewed prescribing a "model" school because he recognized that diversity is both inevitable and desirable in high-quality education. See *Horace's Compromise: The Dilemma of the American High School*, 2d ed. (Boston: Houghton Mifflin, 1985), pp. 225–27.
7. The original principles were stated in our first progress report, *Creating Apprenticeship Opportunities for Youth* (1991).
8. We started our year-end interview with an open-ended question: "Looking back over the past year, what stands out for you in your experience as an apprentice at [firm name]?" Without further prompting, 50 of 59 senior participants responded by describing the technical competencies they had acquired; 44 mentioned procedures—how to accomplish specific tasks on the job. Almost half (23) talked about learning to use computers. Technical competence was especially prominent in the responses of participants in manufacturing and engineering technology (17 of 18) but also among administration and office technology participants (18 of 20) and health care participants (15 of 21). Twelve youth talked about learning principles involved in their work, and seven referred to analytical thinking skills. Participants were much more likely than their classmates who were employed during the school year to report that their work was meaningful. First-year participants were more likely to say their work was meaningful when their firm scored high on a rating of

work experience using the seven principles presented here as evaluation criteria.

9. This and other direct quotations are taken from transcripts of tape-recorded interviews. They are edited for coherence, and conversational expressions (e.g., "you know") are deleted. Brackets denote words not spoken by the interviewee, which are substituted or added for clarity.
10. In their book *The Second Industrial Divide* (New York: Basic Books, 1984), Michael Piore and Charles Sabel identified this need and called for "flexible specialization."
11. Participants who spoke about personal learning discussed career planning most often (44 percent of juniors, 73 percent of seniors). Presumably career planning became more salient as seniors approached graduation.
12. Forty-four percent of seniors spontaneously mentioned learning about organizational systems when asked about their apprenticeship.
13. Thirty-two percent of seniors talked about rules, 29 percent about communication, and 19 percent about working in teams.
14. Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Currency Doubleday, 1990).
15. Heidi Bowne, former vice-president for human resources at The Raymond Corporation, alerted us to the importance of linking youth apprenticeship with a firm's strategic plan and demonstrated how that can be done. Heidi made sure that the program contributed to a human resource strategy that was, in turn, a part of the firm's strategic plan. The Raymond Corporation was committed to increasing the skill level and flexibility of its employees and designed its youth apprenticeship to produce highly skilled workers with many competencies.
16. This statement is based on an interview transcript that Valerie Mahar revised.
17. Some programs use the German term Meister (master) for this role. We have not done so for several reasons. A German Meister is literally a master of a craft, and only a Meister is formally permitted to train apprentices. In practice, however, most German apprentices spend most of their time working alongside a journeyworker; the Meister functions more as what we call a manager. In the United States, coaches are more like what the Swiss call *Lehrmeister*, who are formally trained and certified as apprentice trainers without the courses and examinations that would qualify them as masters of their trade.
18. The original mentor was Odysseus's friend in whose care he left his son, Telemachus, when he left Ithaca to fight in the Trojan War. Would-be mentors should pause to consider that Mentor was Athena in disguise. Taking the role of the goddess of wisdom is a daunting challenge!
19. This is the goal of High Schools That Work, a program of the Southern Regional Education Board.
20. Among the three classes that had completed their senior year at this writing, 47.5 percent enrolled in math courses during their senior year, and only 30.5 percent enrolled in science courses. Proportionately more members of the comparison group enrolled in math (64.2 percent) and about the same proportion (36.5 percent) enrolled in science.
21. We calculated mean grade point average (GPA) for participants, including only academic courses. Their mean GPA began at the B-/C+ level in grade 10. It moved slightly downward in grade 11 and then moved up in grade 12. Participants' GPAs improved in grade 12 over both previous years, but GPAs for the comparison group showed a similar pattern. Changes in both groups' grade levels from one year to the next were statistically significant, but differences between participants and the comparison group were not (controlling for GPAs in grade 10). Therefore, even though the participants' grade 12 GPAs were higher than those of the comparison students, the difference might not be attributable to youth apprenticeship. We used

school records to compare the yearly total of absences for participants and the comparison group. Just as GPAs rose, on average, in grade 12, so did absences. Absence rates were similar in grade 10 for participants and comparison students. But absences in the comparison group were more numerous than among participants in grades 11 and 12. Participants' absences decreased slightly in grade 11, while the rate for comparison students increased, yielding a statistically significant difference between them in that year. The increase in absences from grade 10 to grade 12 is statistically significant for both groups. Although participants were absent, on average, almost two fewer days than comparison students in grade 12, the difference is not statistically significant.

22. Principles of Technology, a course designed by the Center for Occupational Research and Development and widely used in Tech Prep programs, is an excellent example of such a course. See Dan Hull, *Opening Minds, Opening Doors: The Rebirth of American Education* (Waco, TX.: Center for Occupational Research and Development, 1993).
23. Fifty-six percent of graduates from the classes of '93 and '94 ($n = 36$) continued by making progress toward a college degree related to their occupational area in their first year after high school; 44 percent did so in their second year after high school.
24. Two youth from the classes of '93 and '94 ($n = 36$) continued in their occupational area through work but not postsecondary education in their first year after high school; one youth did so in the second year after high school. We included in this category only former participants in positions they could not have qualified for without their youth apprenticeship.
25. Seventeen percent of participants from the classes of '93 and '94 ($n = 36$) redirected their career path via further education in their first year after high school; 22 percent did so in their second year after high school. One redirected via work during both years.
26. Two youth from the classes of '93 and '94 ($n = 36$) explored their career options by entering a liberal arts program with no career focus their first year in college; one in the second year. One youth explored options during the first two years after high school in the military.
27. Paul Osterman, *Getting Started: The Youth Labor Market* (Cambridge, MA.: MIT Press, 1980).
28. Eight percent from the classes of '93 and '94 ($n = 36$) were undirected toward a career goal in their first year after high school; 19 percent in their second year after high school. We counted work as a cashier as undirected even though a former participant might see it as related to administration and office technology, because recent high school graduates without training are often hired as cashiers. Participants' reasons for not enrolling in college include *financial* (e.g., work to save money for college, no money, no transportation, work for money for car for transportation, money for child); *personal* (e.g., illness, stress, marriage, break before going to school); *no plan* (e.g., no desire, not getting application in on time, not sure what will do); *academic* (e.g., poor grades); *family obligations* (e.g., care of child or relative). These reasons also explain why eight participants who did enroll in college dropped out, stopped out (stopped/dropped out and reenrolled), or enrolled part-time in college during their first two years after high school.
29. Nine youth from the first three classes ($n = 59$) were married or had financial or custodial responsibilities for a child during the first two years after their high school graduation; eight of those did not enroll or continue in college full-time for one semester or longer.
30. John Dewey, *Democracy and Education* (1916; rpt. New York: Free Press, 1966), p. 307.
31. Carol Gilligan, *In a Different Voice* (Cambridge, MA.: Harvard University Press, 1982).

Appendix

Table 1

Program Enrollment, 1990–1996

	11th grade		*12th grade*		*13th college*[1]		*14th college*	
Participants	*Started*	*Finished*	*Started*	*Finished*	*Started*	*Finished*	*Started*	*Finished*
Class of '93	22	20	20	20	2	2	2	2
Class of '94	21	19	17	16	3	2	2	2
Class of '95	28	26	25	23	4	3	—	—
Class of '96	29	28	27	26	—	—	—	—
Totals	100	93	89	85	9	7	4	4

[1] The number enrolled in college is the number of youth who continued the apprenticeship program while enrolled in college.

Note: Dashes indicate that no information was available at the time of the report.

Table 2

10th Grade GPA of All Participants Who Entered the Demonstration Project

				Range	
Participants	*GPA*[1]	*SD*[2]	*n*	*Min*	*Max*
Class of '93	81.05	6.60	22	70.56	94.25
Class of '94	80.43	4.29	21	68.50	88.25
Class of '95	75.51	7.29	28	54.50	86.25
Class of '96	80.36	5.90	29	68.50	94.60

[1] Core GPA: Core courses include all courses taken within each of the four academic core departments, that is, English, math, science, and social studies. The core Grade Point Average (GPA) for an individual is calculated by multiplying each core grade by the number of units, summing across all core courses, and dividing by the number of units (i.e., credit hours). The core GPA for a group (participants or comparison) is calculated by summing all individual core GPAs and dividing by the number of people in the group. GPAs are reported on a 100-point scale in which 90–100 = A, 80–89 = B, 70–79 = C, etc.

[2] Theoretically, about two-thirds of a population, or 68 percent, are within one Standard Deviation of the mean (above or below).

Table 3

Education Level Attained by Participants' Parents

Highest level of either parent[1]	*n*
4 years of college or more	18
2 years of college	25
High school diploma	52
No high school diploma	2
No information	3
Total	100[2]

[1] Based on 70 parent reports and 27 child reports. (Child reports were used when parent reports were not available.)
[2] Because n = 100, numbers are identical to percentages.

Table 4

Gender of Participants

Gender	*AOT*	*MET*	*HC*	*Total*
Male	7	24	10	41
Female	30	4	25	59
Total	37	28	35	100[1]

[1] Because n = 100, numbers are identical to percentages.
Note: Table 4 gives the gender of participants at the time of enrollment in each of the three occupational areas. Four males switched occupational area but remained in the program.

Table 5

Race or Ethnicity of Participants

Race or ethnicity	*AOT*	*MET*	*HC*	*Total*
Asian	1	1	0	2
African American	1	4	3	8
Hispanic	1	1	0	2
Native American	1	0	0	1
White	33	22	32	87
Total	37	28	35	100[1]

[1] Because n = 100, numbers are identical to percentages.

Principles and Choices for High-Quality Work-Based Learning

This rating form for evaluating work-based learning programs is intended primarily as a diagnostic and planning tool. Applied to a particular program or plan, the rating form can help to identify strengths and limitations and to set priorities for program development. Repeated over time, it can also serve as a progress record.

1. **Technical Competence.** Youth gain basic and high-level technical competence through challenging work.
   - ___ *Identify work tasks that teach technical competence.*
   - ___ *Organize learning objectives as modules in core and elective units.*
   - ___ *Design a multi-year learning plan that is increasingly challenging.*

2. **Breadth.** Youth gain broad technical competence and understand all aspects of the industry through rotation and projects.
   - ___ *Inform youth about all aspects of the industry.*
   - ___ *Rotate youth through several departments or placements.*
   - ___ *Support projects and activities that teach multiple skills and broad knowledge.*

3. **Personal and Social Competence.** Youth gain personal and social competence in the workplace.
   - ___ *Recognize personal and social competencies as key learning objectives.*
   - ___ *Systematically teach social and personal competence in context.*
   - ___ *Provide extra assistance to youth who lack personal and social competence through case management.*

4. **Expectations and Feedback.** Workplace teachers convey clear expectations to youth and assess progress toward achieving them.
   - ___ *State expectations in advance for behavior and learning.*
   - ___ *Regularly monitor and document acquisition of competence.*
   - ___ *Provide feedback on progress to youth, school, parents, and firm.*
   - ___ *Encourage youth to assemble a portfolio.*
   - ___ *Eventually use industry-wide standards to provide portable credentials.*

5. Teaching Roles. Youth learn from adults with formally assigned teaching roles.

___ *Assign clear teaching roles and responsibilities to a coordinator, managers, coaches, and mentors.*

___ *Authorize teaching roles in job descriptions and performance assessments.*

___ *Orient, train, and support adults who teach youth.*

6. Academic Achievement. Youth achieve high academic standards.

___ *Work closely with schools and postsecondary institutions to set high academic standards.*

___ *Specify courses and degrees related to the career areas.*

___ *Open multiple options for postsecondary education.*

7. Career Paths. Youth identify and follow career paths.

___ *Provide career exploration opportunities and information on related careers.*

___ *Advise youth about career paths, coordinating with high school and college advisers and with parents.*

___ *Pay particular attention to the post–high school transition.*

Quality rating

5 = Excellent:	nearly always present, planned, a priority; done exceptionally well
4 = Good:	between moderate and excellent
3 = Moderate:	present occasionally, occasionally planned, occasionally a priority; done moderately well
2 = Fair:	between moderate and poor
1 = Poor:	absent or rarely present, rarely planned or not, rarely a priority or not; done poorly

http://www.human.cornell.edu/youthwork/tools/app_cnt.htm

Work Tasks: The Source of Technical Learning

Employers used this process to clarify youth work and learning within each department. Managers first identified work tasks that the youth would do in their department. Next, they listed technical learning related to each task. This worksheet includes examples from a publications department within an administration and office technology apprenticeship.

Work Tasks in a Department

Department Publications

Manager Susan Jones

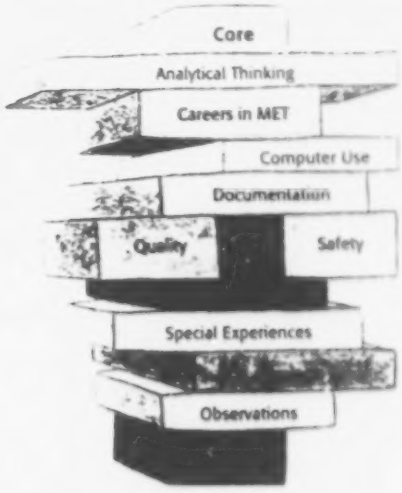
Apprenticeship Administration and Office Technology

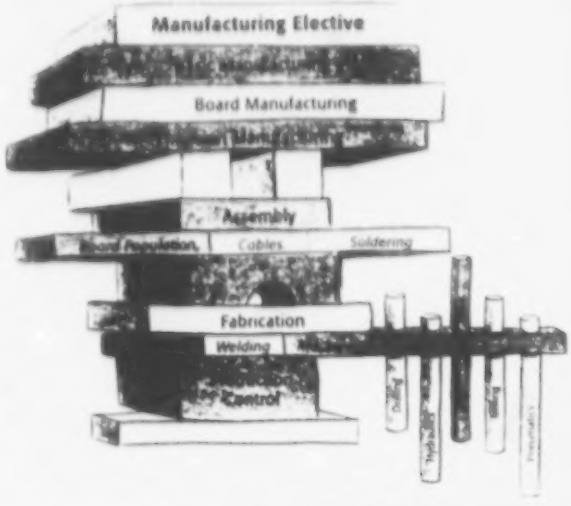
	Technical learning		
Task #	Procedures	Computer skills	Principles
1. complete forms	make changes	image edit, Pagemaker, desktop pub.	basics in layout, paste-up
2. basic office skills	filing, copying, sending faxes		
3.			
4.			
5.			
6.			
7.			
8.			

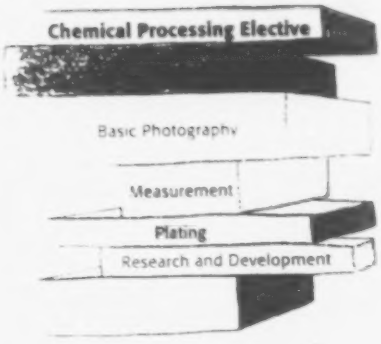
http://ucwc.human.cornell.edu/youthwork/pools/tasks.htm

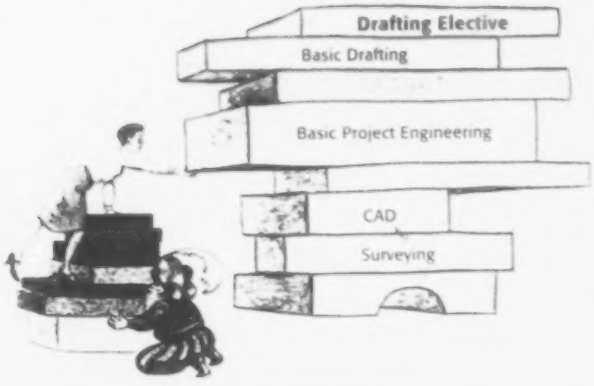
Building Blocks for MET Programs

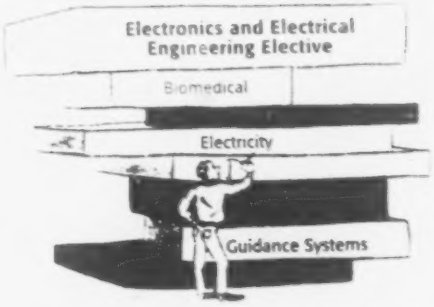
Employers decide what youth should learn. Modules are sets of related learning objectives (see Documentation module, p. 35). Related modules can be grouped into units. The building blocks below illustrate units and their modules used in manufacturing and engineering technology youth apprenticeships. Modules and units may be modified and combined in different ways to meet the needs of youth and employers.

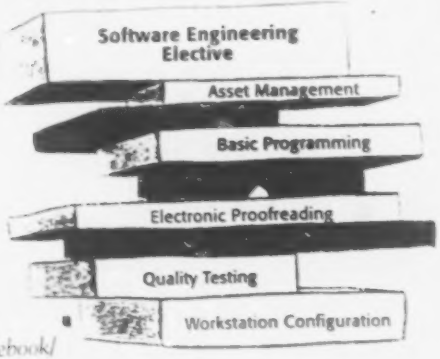












http://www.human.cornell.edu/southwork/ptools/notebook/

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Senior Project Issues

Key Question-Issue	Research Steps	Benefits
How does the Americans with Disabilities Act (ADA) conflict with collective bargaining agreements?	Read articles and legislation such as the Civil Rights Act. Interview human resources personnel and building designer. Write up "Do's and don't's" of ADA. Create manual, including questions you can and cannot ask job candidates.	Manual will be available for people who interview future job candidates.
How should overloans be calculated and what procedures should be followed with them?	Review cases in which policy holders have borrowed more than the value of their policy. Standardize terms.	All employees can use the procedure manual, standard spreadsheets, and form letters.
What are the key developmental points for babies and what is their impact on moms during the first year?	Review pamphlets, videos, readings. Interview coach. Devise calendar of developmental events, for example, baby's first tooth.	Distribute calendar to future moms and new moms.
What resources are available for disabled children and how can parents have easier access?	Identify organizations for parents of children with disabilities from magazines. Write 26 letters of inquiry. Do phone interviews. Organize responses in a computer database. Create a pamphlet.	Provide parents and teachers with a pamphlet about activities and options for children with disabilities.
What is Guillain-Barré Syndrome? How is it treated? What is the psychosocial impact on the patient?	Read medical literature. Interview physicians, nurses, occupational therapists, and physical therapists. Interview patient and his spouse.	Produce videotape for educating health professionals, patients, and their families about the disease.
What are the electrical power requirements for equipment in a silver analysis laboratory, along with the general room power and lighting?	Gather information: read equipment specifications and nameplate data, interview lab technicians and engineers, and review all work with the facilities project engineer. Design: apply information to size electrical circuits per the National Electrical Code, specify required conduit, wire, circuit breakers, disconnect switches, etc. Calculate lighting levels.	Functional design package for electrical services in a new silver analysis laboratory: includes architectural plan-view drawing with associated elevation views, schematics, and single-line diagrams, bill of materials, standard construction notes, and scope of work. All drawing done on AutoCAD. *http://www.human.cornell.edu/southwork/ptools/floor/*

Guide to Evaluating Social and Personal Competence

Social Competence: Participate in an organization

Personal Competence: Act responsibly

http://www.human.cornell.edu/youthwork/tools/gcspc.htm

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Youth Apprenticeship Announcement

Title: Administration and Office Technology **Openings: 4–8 Fall 1995**

Where? **The Raymond Corporation**
Corporate Headquarters
Greene, NY 13778

The Raymond Corporation manufactures equipment used in the storage and retrieval of goods in warehouse and production facilities. Many of the technologies, products and processes now considered industry standards in the narrow aisle material handling market were developed by The Raymond Corporation.

Raymond products are distributed worldwide. The corporation is committed to consistently providing customers quality products and services and continues aggressive research and development to assure a position of technological leadership in the industry.

Time? During the fall and spring semesters, apprentices will report to their assigned locations during school days for 10–12 hours per week. Part-time or full-time employment may be an option during the summer after junior year.

How do you apply? Contact the Apprenticeship Coordinator at your school for further information and to schedule a tour and a career-shadowing opportunity.

What would you do? Apprentices will be trained to perform activities of increasing complexity in non-production and office work areas at Raymond. As apprentices learn to use office equipment such as the phone, fax and computer, they will also gain information-handling competencies. Departments include finance, marketing, human resources, leasing, and the office resource group.

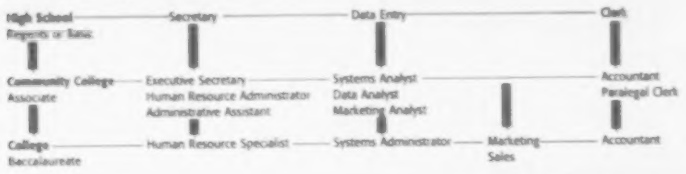
What will you learn? Apprentices will gain a working knowledge of multiple aspects of a manufacturing company leading to career opportunities and related college study in this field. The activities will also provide opportunities for apprentices to gain competencies related to rules, principles, systems, communication, computer use, responsibility, teamwork, and excellence. Apprentices should continue a strong academic program in high school.

What other rewards will you receive? Apprentices will receive minimum wage salary for training 10-20 hours per week on school days during the fall and spring semesters of their junior year. Those who complete this period satisfactorily may be eligible for employment at Raymond during the summer months.

What qualities will we look for in applicants? Applicants should be responsible, reliable, flexible, honest, punctual, and enjoy working around others. They should be willing to take initiative to make things better and ask for help when necessary. Appropriate dress is required. Students are expected to continue studies in math, English, public speaking, and possibly accounting or business courses. Basic keyboarding skills are desirable.

Career Pathways --Administration and Office Technology

What does this apprenticeship lead to?



Cornell Youth Apprenticeship Demonstration Project
February 22, 1995

http://www.human.cornell.edu/youthwork/pools/recruit/position/officera.htm

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YOUTH WORK

Mutual Expectations Agreement

Cornell Youth Apprenticeship Demonstration Project

1. Parties to the agreement

Rebecca Gray	Madison High School
APPRENTICE NAME	SCHOOL
Manufacturing and engineering technology	Hampton Industries
APPRENTICESHIP TITLE	EMPLOYER
Janice Gray	
PARENT/GUARDIAN	

2. Expectations for apprentices

The apprentice agrees to

- complete assigned work tasks
- abide by company policy (e.g., to notify manager if late or absent)
- seek assistance for personal and workplace problems
- participate in the academic components of the apprenticeship offered by the school and the workplace, including to
  - continue to pursue related *academic courses*
  - participate in an *advisory group*
  - complete a *special project* in the senior year
  - maintain a *journal*
  - maintain a *training notebook*
- ask coordinator at the firm for approval of any additional paid employment (including current jobs)

3. Expectations for the school

The school agrees to

- offer a school-based curriculum for apprentices that enriches their learning, including
  - academic courses related to the apprenticeship
  - help with special projects
  - regular meeting with advisory group
- assist with course selection, time use, scheduling, and career pathway decisions
- assign a school apprenticeship coordinator who will foster effective communication links among the school, parents and guardians, and the apprentice
- assist in solving problems

4. Expectations for the employer

The employer agrees to

- structure learning by assigning appropriate work tasks
- enable the apprentice to learn the occupational area described in an attached training document
- evaluate the apprentice's progress periodically each year, sending at least one progress report to the school and to Cornell each semester
- accord the apprentice equal opportunity in all phases of the apprenticeship employment and training, without discrimination because of race, color, religion, national origin, age, sex, disability, or marital status

5. Expectations for parents and guardians

The parent or guardian agrees to

- support the apprentice's effort
- help him or her meet the terms of the contract (e.g., attendance, attire, academic courses, etc.)

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CORNELL YOUTH APPRENTICESHIP ADMINISTRATION PROJECT — MUTUAL EXPECTATIONS AGREEMENT

6. Termination

- The employer may terminate an apprentice for any reason.
- An apprentice may terminate his or her employment for any reason.
- Ordinarily, termination will only occur after serious efforts by all parties to resolve difficulties.

7. Special Arrangements

The following documents are attached:

- Apprenticeship training document ☑ yes ☐ no
- Employer policies and procedures ☑ yes ☐ no
- Orientation materials ☑ yes ☐ no

8. Hours, Duration

Start date September 13, 1993 Program length 4 years Hours per week 15

Holidays see orientation materials School vacation to be arranged Summer hours to be arranged

- Apprentices may choose not to attend work during special exams (e.g., SAT), snow days, etc. They should notify their employer in advance about schedule changes.

9. Compensation

- Pay and progression [Pay progression is not automatic; it depends upon apprentice's skills and increasing value to employer.]

1st year $4.75 2nd year increments based on performance 3rd year _____ 4th year _____

- Other compensation (benefits, tuition assistance, etc.) college scholarship available, other benefits as described in Employer Benefits.

10. Signatures

Rebecca Gray	Ellen Jackson
APPRENTICE	SCHOOL APPRENTICE COORDINATOR
11 Phillips Drive	15 School St.
ADDRESS	ADDRESS
Metropolis, NY 12345	Metropolis, NY 12345
September 13, 1993	September 23, 1993
DATE	DATE
Janice Gray	Jack Hopkins
PARENT OR GUARDIAN	FIRM APPRENTICE COORDINATOR
11 Phillips Drive	209 Main St.
ADDRESS	ADDRESS
Metropolis NY 12345	Metropolis, NY 12345
Sept 13, 1993	9/20/93
DATE	DATE

Printed on recycled paper

CORNELL UNIVERSITY

http://www.human.cornell.edu/youthwork/ptools/response/mut-exp.htm

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Impacts of Apprenticeship on Employees Who Teach Youth

Seventy coaches, coordinators, mentors, and managers were asked the question: "What have you learned from your involvement with the apprenticeship program about yourself, about youth, about your workplace?" We interviewed 24 adults at the end of the first program year and 46 at the end of the fourth. The numbers in parentheses indicate how many interviewees mentioned a category. Because each person could give more than one response, totals exceed 70.

Improved skills (66) in

Personal competence (62) learned that I enjoy youth, gained self-confidence, gained self-esteem

Social competence (32) how to work with other people, to value human interactions, strengthened supervisory skills with peers

Technical competence (17) analytical thinking, understanding of own job, strengthened technical skills

Improved understanding of youth (56)

Work ethic (36) willingness to work, willingness to be productive, responsible, interest

Learning values (25) questioning attitude, curiosity, willingness to learn

Socioeconomic environment (15) coping/not coping with postponing gratification, health, jobs, economy, family

Future expectations (13) ability of good program to raise level of achievement (to college)

Builds community relationships (9)

Learning to collaborate with schools and community organizations (7)

Prestige of contributing to a regional, state, and national movement (3)

Positive image for company (2)

http://www.human.cornell.edu/youthwork/rtools/intvwcde/impc_cde.htm

Organizational Supports Needed for Employees Who Teach Youth

Seventy coaches, coordinators, mentors, and managers were asked three questions about supports needed to teach youth in the workplace:

1. "What should new coaches (or person in your role as coordinator, mentor, manager) know before they start?"
2. "What kinds of supports, information, and training do you think would help make people better coaches (or coordinators, mentors, managers)?"
3. "What other thoughts or ideas do you have for improving the way the program runs?"

We interviewed 24 adults at the end of the first program year and 46 at the end of the fourth. The numbers in parentheses indicate how many interviewees mentioned a category. Because each person could give more than one response, totals exceed 70.

Address Issues and Challenges (69)

Secure authorization (48) for
- time (38)
- management support (20)

Train mentors (41) in
- how to make rules and expectations clear (24) about
  - negative behaviors (e.g., lack of assertiveness, poor attendance, weak commitment, dislike of work area, poor relationship with coach) (14)
  - cultural expectations (e.g., dress code, time card) (3)
- how to understand teenage perspective and frame of reference (17)
- how to build relationships (talk through problems, build good rapport) (12)
- how to overcome own prejudices (4)

Build external linkages (40) to improve
- communication lines about apprentice development (21)
- school schedules (increase time at work, summer preparation, fit into firm's work flow) (15)
- school-based learning (course selection, school performance) (11)
- let other companies know of the program's success (5)

Clarify program structures (36), such as
- evaluation procedures (expectations of students and adults, frequency, paperwork, access portfolios) (21)
- rotation (when and how often, rationale for department choices and type of work, breadth) (16)
- recruiting youth into the program (8)

Train coaches (31) in
- how to give constructive feedback (21)
- how to identify work tasks (consider youth's interest, the place of mental and repetitive tasks, the work pace, how meaningful the tasks are) (20)

Ways to get information and address issues (41)

Meet (33) for training, workshops, committees, and orientation within own firm and outside

Network (15) about ideas that work, anxieties, issues, how to handle problems

Read (11) packets, guides, letters, newsletters

Observe (1) coaches and apprentices in firm and in other firms

http://www.human.cornell.edu/youthwork/tools/intrvwckd/supp_ckc.htm

Table 6

Relationship of Participants' Post–High School Career Paths to Their Apprenticeship, Classes of '93 and '94

		Continuous		*Redirected*		*Exploratory*		*Undirected*		*Other*[1]	
	n	#	%	#	%	#	%	#	%	#	%
1st year after HS	36	22	61.1	7	19.4	3	8.3	3	8.3	1	2.8
2nd year after HS	36	17	47.2	9	25.0	2	5.6	7	19.4	1	2.8

[1] The person coded as *Other* continued in the occupational area but in an unskilled job.

Table 7

Participants' Progress toward a Degree after High School Graduation, Classes of '93 and '94

		Progress				*No Progress*[1]					*Other*[2]
	n	Continuous	Redirected	Exploratory	%	Continuous	Redirected	Exploratory	Undirected	%	
1st year after HS	36	20	6	2	77.8	2	1	1	3	19.4	1
2nd year after HS	36	16	8	1	69.4	1	1	1	7	27.8	1

[1] *No Progress* includes youth who did not enroll or enrolled but did not make progress toward a college degree: one youth dropped out during the first year; two youth during their second year.

[2] The person coded as *Other* continued in the occupational area but in an unskilled job.

Netscape: Cornell Youth and Work Program

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Location: http://www.human.cornell.edu/youthwork/

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CORNELL YOUTH AND WORK PROGRAM

College of Human Ecology

PREPARING YOUTH FOR THE FUTURE

Cornell University

Bulletin Board

Publications

Program Tools

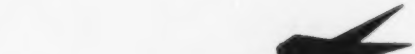
Research Tools

Welcome to the Cornell Youth and Work Program

The Cornell Youth and Work Program fosters the transition of youth to adulthood through research and development on school-to-work opportunities. We focus on the quality of work-based learning.

Our products include program tools, research tools, and publications. You may read these documents, download them, and adapt their tools for your own purposes. A bulletin board encourages communication with us and with other users.

URL: http://www.human.cornell.edu/youthwork/
e-mail: cywp@cornell.edu



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